

# Complete Guide to Understanding the Citrix Logon Process

A Technical How-To Guide for Proactively Troubleshooting & Resolving Citrix Logon Issues

Written By: Goliath Technologies Technical Team

Updates By: George Spiers, Citrix CTP

# Contents

Technical Summary .....	3
What is the Citrix Logon Process?.....	3
A. Description.....	4
Logon Duration Stages.....	4
A. Logon Duration Brokering Stages .....	6
B. Delivery Controller Stages.....	6
C. Citrix Workspace app Startup Stages.....	7
D. Logon Stage Details.....	9
Correlate Stages to Logon Process .....	10
How to Use It.....	10
A. How to Troubleshoot Isolated User Logon Duration Slowness.....	11
B. How to Troubleshoot Entire User Base Logon Duration Slowness .....	13
Use Cases - How Goliath Customers Use the Technology .....	14
Logon Slowness due to Drive Mapping Execution.....	14
AD Group Membership/Logon Script/Registry Extension Mappings Causing Logon Slowness .....	16
Print Driver Support and Missing Print Drivers Causing Long Logons .....	17
Logon Script Improperly Coded .....	19
Summary .....	20
About the Authors.....	21

# Technical Summary

Troubleshooting and permanently resolving Citrix logon duration issues is an excruciating challenge for most Citrix Engineers. Unfortunately, obstacles to troubleshooting are further accentuated by the fact that many tools on the market are either ill-equipped to provide the level of detail necessary to determine root cause, or simply provide inaccurate metrics based on flawed calculation methodology.

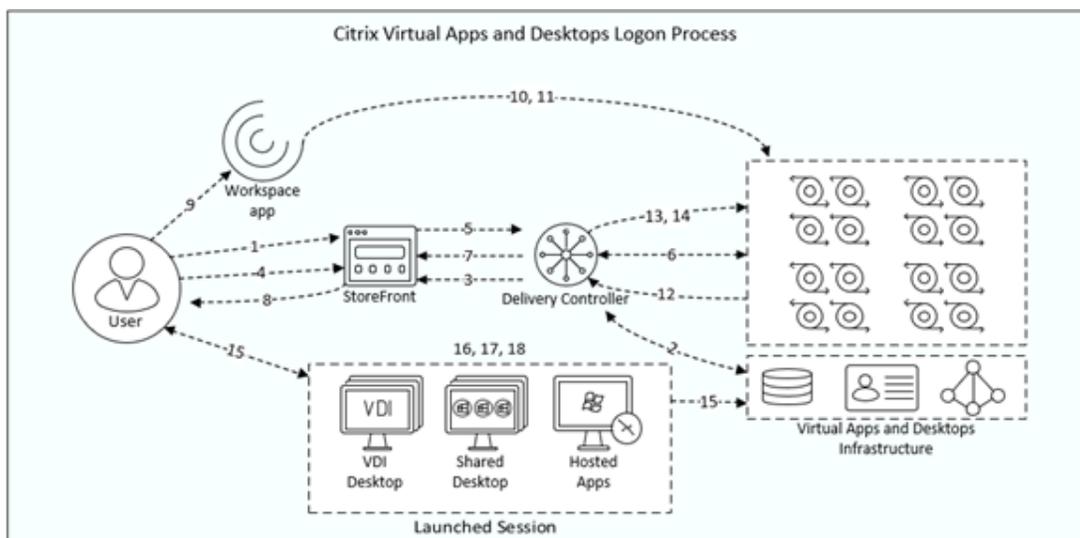
For instance, many products advertising that they provide logon duration present values for each stage of the logon process that neatly break down and add up to the sum of overall logon time. On the surface this seems to make sense intuitively, but is actually completely inaccurate. The Logon Duration in a Citrix environment is famously intricate, with many of the stages occurring simultaneously and overlapping – meaning that the total logon time will almost never equal the sum of its parts. In fact, there are 33 stages in the overall logon process just to get a user session brokered to its session host.

This guide will review the complexities of the Citrix logon process, how it actually works, and the explicit micro stages of the logon process. Then we will discuss how Citrix Administrators use this level of detail to pinpoint root cause of logon duration issues, and how they use a combination of technology and analysis to troubleshoot and resolve these performance issues for end users.

## What is the Citrix Logon Process?

While the Citrix logon process (when configured correctly) may only take a couple seconds to launch, its execution comprises a complicated sequence involving the Citrix Workspace app, Citrix Brokering Architecture/ADC, StoreFront, Delivery Controller, and the Session Host/App Server, or VDI.

Before we begin understanding how to identify the root cause of a logon duration issue, we need to first understand at a high level what actually occurs, and in what sequence, during the logon duration process. The diagram below presents the sequence of events that occur during the logon process from the time when a user clicks on the icon for an app or desktop, to when it fully launches:



## A. Description

As you can see, there is no straight line in this process marching neatly forward towards the launched desktop. Instead, the process takes a series of steps back and forth from the user's endpoint to the session host before the user ends up seeing their desktop or application.

To better understand what is happening at each stage, you can map the process step to what's happening by referencing each line below to its step in the diagram above:

- 1. End user logs on (in this example, to StoreFront)**
- 2. Delivery Controller contacts SQL for a list of resources to present to the end user**
- 3. StoreFront enumerates the desktops and/or applications the user is entitled to**
- 4. End user clicks on a desktop or application (in this example, from StoreFront) to launch it**
- 5. StoreFront requests a session host from the Delivery Controller**
- 6. Delivery Controller selects a session host**
- 7. Delivery Controller sends session host hostname & IP address to StoreFront**
- 8. StoreFront creates the ICA File and sends it to Citrix Workspace app**
- 9. Citrix Workspace app launches the ICA file**
- 10. Citrix Workspace app determines and then checks that the connection to the session host can be established**
- 11. Citrix Workspace app establishes an ICA connection to the session host**
- 12. Delivery Controller creates a user session**
- 13. Delivery Controller processes Citrix policies**
- 14. Session is brokered by the Delivery Controller to the session host**
- 15. User Authentication between domain controller and session host**
- 16. End User sees the Citrix session window open and the Windows welcome screen**
- 17. Profile Load, Group Policies (GPO), and script execution take place**
- 18. Application/Desktop is fully launched**

The fact that this process can be achieved in less than 10 seconds is quite amazing, and in this document, we're going to show you how to perform an autopsy on a user's poor logon process to identify why that happened.

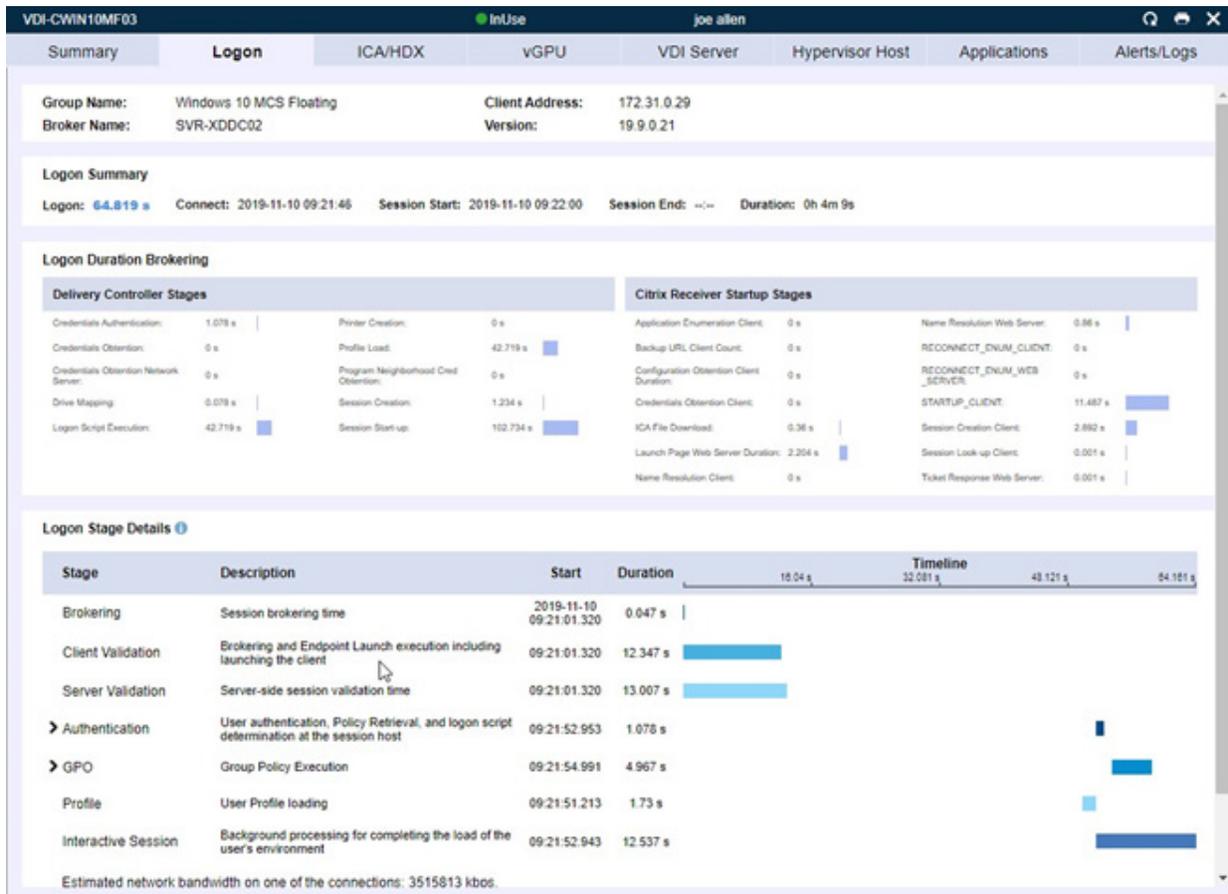
## Logon Duration Stages

In order to understand exactly what is happening and troubleshoot, we need to break out the sequence to each of the executions that Citrix is processing during the logon process. This is functionally categorized into three different aspects of the logon process – the brokering process that the Delivery Controller facilitates, Citrix Workspace app's process to establish the ICA Connection, and desktop load process for the application or desktop on the session host.

Combining in-depth Citrix data and Windows OS logging data, the Logon tab breaks down the user's login from start to finish, providing the administrator with actionable metrics to reduce troubleshooting times.

The Logon tab is comprised of four main sections displaying a wide variety of data to assist in diagnosing slow logon times. Each of the logon stages is presented with easy to identify graphs to quickly see where the majority of time is spent in the process, saving you time in getting to the root cause of potential problems.

**Fig. 1 Session dialog - the Logon tab at a glance:**



From the top of the dialog, the first section presents general session information. This information will differ if you're reviewing a Published app or desktop session versus a Virtual Desktop. The example in Figure 2, below, displays a Virtual Desktop session, which includes the Delivery Group name, the endpoints IP address, the Citrix broker responsible for the connection and the version of Citrix Workspace app the endpoint has installed.

**Fig. 1a Virtual Desktop session information**

Group Name:	Windows 10 MCS Floating	Client Address:	172.31.0.29
Broker Name:	SVR-XDDC02	Version:	19.9.0.21

The next area is a Logon summary where you can find actual logon duration time as well as session start, duration, and end time if applicable.

**Fig. 1b Logon summary**

<b>Logon Summary</b>									
Logon:	64.819 s	Connect:	2019-11-10 09:21:46	Session Start:	2019-11-10 09:22:00	Session End:	--:--	Duration:	0h 4m 9s

## A. Logon Duration Brokering Stages

The middle section of the Logon tab displays the logon duration brokering stage data for both the Delivery Controller and the Citrix Workspace app startup stages.

## B. Delivery Controller Stages

Fig. 1c Delivery Controller Stages

Delivery Controller Stages			
Credentials Authentication:	1.078 s	Printer Creation:	0 s
Credentials Obtention:	0 s	Profile Load:	42.719 s
Credentials Obtention Network Server:	0 s	Program Neighborhood Cred Obtention:	0 s
Drive Mapping:	0.078 s	Session Creation:	1.234 s
Logon Script Execution:	42.719 s	Session Start-up:	102.734 s

### ▶ Credentials Authentication:

- ▶ The time spent on the server authenticating the user credentials against Active Directory.

**Tip:** A slow authentication stage may indicate an improper site configuration. An example would be if your user is logging into a datacenter in one location and is being authenticated by a domain controller in another physical location. This would indicate misconfiguration in Active Directory Sites and Services.

*Another point to consider would be a site DNS issue, or simply overloaded Domain Controllers.*

### ▶ Credentials Obtention:

- ▶ The time taken for credentials to be passed through to the server.

### ▶ Credentials Obtention Network Server:

- ▶ Network credential retrieval for passthrough authentication.

### ▶ Drive Mapping:

- ▶ Client passthrough drives, port and device mapping.

**Tip:** Create policies to disable unnecessary ports, drives, and devices to reduce bandwidth and resource consumption.

### ▶ Login Script Execution:

- ▶ Time spent executing user login scripts.

**Tip:** Find scripts executed by the user and manually run them to observe how long they take to execute and observe failures in execution that may cause delays. We would recommend using a test account which is in the same set of AD Security Groups as the affected user to ensure you have a similar permission set for testing, which can be useful, then testing scripts that map network drives etc.

- ▶ **Printer Creation:**
  - ▶ The time spent mapping the user's client printers.
 

**Tip:** *Check the health of mapped printers and print servers and make sure they are online, otherwise logons may be impacted.*
- ▶ **Profile Load:**
  - ▶ The time spent loading the user's profile.
 

**Tip:** *Check the size of the user's roaming profile. Find large folders or folders with many small files, and work on creating policies to reduce the number of folders and files included in the profile.*
- ▶ **Program Neighborhood Cred Obtention:**
  - ▶ The time needed for the server to cause the Program Neighborhood instance running on the client to obtain the user credentials.
- ▶ **Session Creation:**
  - ▶ The time the server spends creating the session.
- ▶ **Session Startup:**
  - ▶ This is the high-level server-side connection start-up metric that encompasses the time Virtual Apps and Desktops takes to perform the entire start-up operation. When an application starts in a shared session, this metric is normally much smaller than when starting a new session, which involves potentially high-cost tasks such as profile loading and login script execution.

## C. Citrix Workspace app Startup Stages

**Fig. 1d Citrix Workspace app Startup Stages**



- ▶ **Application Enumeration Client:**
  - ▶ Application enumeration is one of the issues slowing down session start times.
 

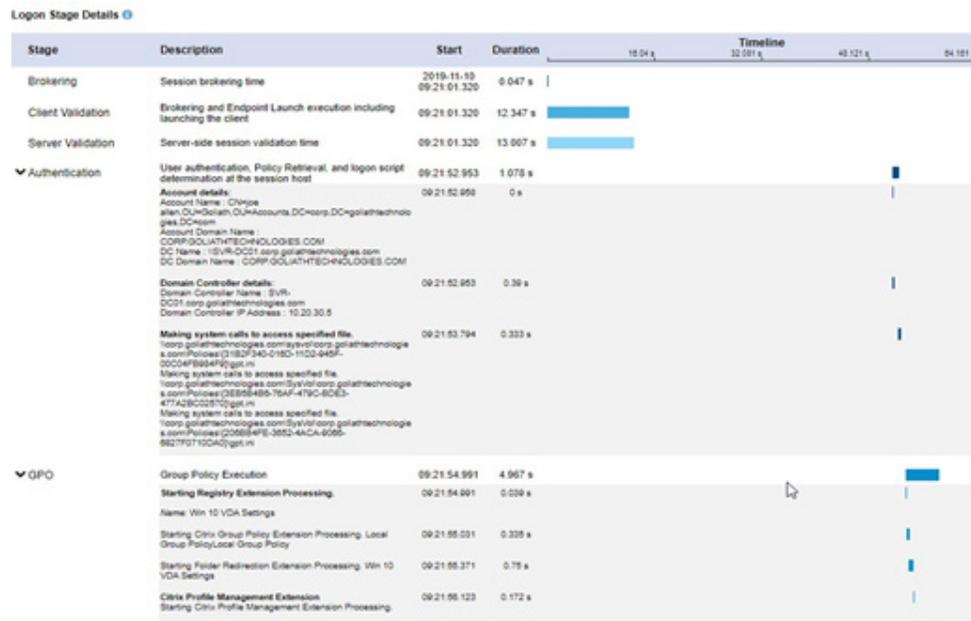
**Tip:** *Check the health and performance of your Delivery Controllers and SQL infrastructure.*
- ▶ **Backup URL Client Count:**
  - ▶ If this metric has a value higher than 1, it indicates the StoreFront server is unavailable and the Workspace app is attempting to connect to back-up StoreFront servers to launch the application.
- ▶ **Configuration Obtention Client Duration:**
  - ▶ The time it takes to get the configuration file from the XML server

- ▶ **Credentials Obtention Client:**
  - ▶ The time it takes to obtain user credentials when the user credentials are manually entered by the user.
- ▶ **ICA File Download:**
  - ▶ The time it takes for the client to download the ICA file from the server.
- ▶ **Launch Page Web Server Duration:**
  - ▶ Review the information for IFDCD. The LPWD metric is only used when Web Interface is the application launch mechanism.
- ▶ **Name Resolution Web Server:**
  - ▶ When this metric is high, there could be an issue with the StoreFront server, the XML Service, the network link between the two, or a problem in FMA.  
*Tip: Like Name Resolution Client, this metric indicates how long it takes the XML service to resolve the name of a published application to a Virtual Delivery Agent IP address. However, this metric is collected when a StoreFront server is performing this process on behalf of a launch request it has received from either the Workspace app client (previously known as Citrix Receiver) or from a user clicking a published resource from the StoreFront web page. This metric applies to all sessions launched through StoreFront or Citrix Workspace app (formerly Citrix Receiver).*
- ▶ **Reconnect Enum Client:**
  - ▶ The time spent for the user's client to get a list of reconnectable sessions.
- ▶ **Reconnect Enum Web Server:**
  - ▶ The time it takes the StoreFront to get the list of reconnections for this user from the XML service.
- ▶ **Session Creation Client:**
  - ▶ The time it takes to create a new session, from the moment wfica32.exe is launched to when the connection is established.
- ▶ **Session Lookup Client:**
  - ▶ The time it takes to query every session to host the requested published application.
- ▶ **Ticket Response Web Server:**
  - ▶ The time it takes to get a ticket from the STA server or XML service.  
*Tip: This can indicate that the Secure Ticket Authority server is overloaded.*

## D. Logon Stage Details

The Logon Stage Details section of the Logon tab is unique to Goliath Performance Monitor. It presents a granular breakdown of the login process by combining all of the above metrics with information included in the Goliath logs. This approach saves time and testing efforts by highlighting specific details during the login process that an administrator would normally have to dig through logs and other areas to obtain.

**Fig. 5 Logon Stage Details**



As seen in the image above, some of the stages of the logon process can be expanded to drill in to specifics about the individual logon stage process.

The Authentication section is key to determining which domain controller processed the login as well as the time it took to read group policy objects. One of the key metrics here is the domain controller's location. An improper site configuration could have a client authenticating through a domain controller not local to the client. Another key metric would be the client's ability to read the Group Policy file and how long that read takes.

Active Directory Sites and Services should be correctly configured so that authentication and Group Policy processing occurs with a local domain controller for best performance.

The GPO section displays the amount of time to process each group policy object. Long GPO processing could indicate invalid printer mapping or network drive mapping.

In summary, Goliath Performance Monitor's Logon tab provides administrators with a unique view into the login process by combining data from Citrix as well as Windows log information to assist in troubleshooting slow logons and getting to root cause much faster.

## Correlate Stages to Logon Process

So how does this all fit together? Because of the overlap of each stage during the logon process, it is necessary to understand how the logon process breaks down and layers together. The stages we have covered and how they interrelate with each other is depicted in the image below, and the stages indicated match back to what you see above.

When troubleshooting logon times affecting the first two phases especially, this diagram should be used as a primer to understand how a phase that took an extended period of time fits into the rest of the process, and the server responsible for the slowness.



## How to Use It

When working with individuals who administer/support/manage Citrix environments, it has become the general understanding that logon issues typically are found to manifest in one of two ways:

- ▶ **Isolated Users:** Logon slowness which only impacts isolated users or location.
- ▶ **Entire User Base:** Where the slowness impacts a larger subset of the user base, or possibly the entire user base.

In order to better determine the root cause for each of these situations, we typically recommend following a troubleshooting process which caters to the scenario at hand. By doing so, you provide yourself with the means to not only gain visibility into the issue, but you will also allow yourself the best opportunity for objective evidence, which you'll need for root cause analysis.

Below are some examples on how a Citrix Engineer/Administrator would be able to utilize a monitoring solution to troubleshoot longer than normal logon durations. We will break these into the two scenarios as mentioned above (individual user vs entire user base.)

## A. How to Troubleshoot Isolated User Logon Duration Slowness:

### Awareness:

- ▶ The biggest challenge in the case of individual user logon slowness is knowing when the problem is occurring. To do so, you need to have alerts so you're not waiting to hear from the end user. The first step is to configure alerts so you know when and how often the logons take longer than the acceptable duration for your environment. Once you configure the rule, you would then need to apply that threshold to your entire user base. Goliath Performance Monitor will allow you to set a custom threshold if, for example, the logon duration exceeded 1 minute or 90 seconds for a user. It will then automatically send a notification by email, text message, or via your enterprise monitoring solution.
- ▶ Secondly, we will want to schedule one of the 66 out-of-the-box reports available within the technology which can provide a historical view of the logon durations for your user base. We would typically recommend that this report is sorted by the logon duration time, and in ascending order so that you are able to view the highest logon durations at the top of your report. If you set the report to run on a daily basis, for example, every morning at 10 AM, you will have a report listing out the logon durations for your entire user base prepared for your review. Goliath Performance Monitor provides this type of reporting, and will also allow you to report on a subset (such as the top 20 logon durations) of users, as well as break down / drill into each specific user's logon process to determine the exact timings for each step of their logon process. This is beneficial when determining root cause for logon duration slowness issues.

### Troubleshooting Process:

- ▶ Assuming you've configured the alert notifications surrounding logon duration times, you may have received an alert already, or a ticket or call may have been escalated to the Citrix support team.
- ▶ Navigate to the Citrix Virtual Apps & Desktops display, where you can then search for the user and bring up their session details, including the breakdown of the user's logon process.
- ▶ Drill into the user's logon duration breakdown.

User Account	XA Server Name	Session	State	Client Name	Client Address	Version	Logon	ICA Latency	Avg. ICA Lat.	Delivery Group	Connected	Logoff/Disconnected
gpl01	W020	HDX - Desktop	Active	SATB-G17KJG2	10.12.22.46	14.11.0.17061	123.4s	0ms	0ms	EAS Desktop 2016	2019-12-03 15:20:58	
gpl02	W122	HDX - Desktop	Active	SATB-GUB3F21	10.12.22.26	14.2.0.10	72.6s	0ms	0ms	EAS Desktop 2016	2019-12-03 15:20:45	
gpl03	W023	HDX - Desktop	Active	TOPDE30603	10.97.45.95	19.9.0.21	73s	0ms	0ms	EAS Desk 2016 Kochi	2019-12-03 15:20:17	
gpl04	W049	HDX - Desktop	Active	SCO-HLSD72	127.0.0.1	18.12.0.12	25.9s	0ms	0ms	EAS Desktop 2016	2019-12-03 15:20:13	
gpl05	W069	HDX - Desktop	Active	SATP-BYSPW01	10.12.21.43	18.9.0.19526	37.7s	0ms	0ms	MARS 2016 Desktop	2019-12-03 15:20:11	
gpl06	W005	HDX - Desktop	Active	D-113156415	10.182.35.82	14.9.0.2539	0s	0ms	0ms	Roxwood Developer	2019-12-03 15:20:06	
gpl07	W056	HDX - Desktop	Active	NYC-C789F2	127.0.0.1	18.12.0.12	153.7s	0ms	0ms	EAS Desktop 2016	2019-12-03 15:19:44	
gpl08	W060	HDX - Desktop	Active	PORL-HFRJL72	10.30.20.16	14.10.1.22	96.2s	0ms	0ms	Insurance Desk 2016	2019-12-03 15:19:10	
gpl09	W066	HDX - Desktop	Active	D-113168823	10.182.35.134	14.7.0.13011	0s	0ms	252ms	ACSP Desktop 2016	2019-12-03 15:18:45	
gpl10	W015	HDX - Desktop	Active	BRZ-S9KFGM2	127.0.0.1	18.12.0.12	106.9s	523ms	306ms	Braci 2016 Desktop	2019-12-03 15:18:42	
gpl11	gpl02	HDX - Desktop	Active	SATP-BYSPW01	10.12.21.43	18.9.0.19526	37.7s	0ms	0ms	Braci Developer Desktop	2019-12-03 15:18:40	
gpl12	W066	HDX - Desktop	Active	RIC-84J0302	10.31.20.41	14.4.0.8014	16.7s	0ms	0ms	EAS Desktop 2016	2019-12-03 15:18:37	
gpl13	W027	HDX - Desktop	Active	RIC-JDKT202	10.31.21.38	14.4.0.8014	92.4s	0ms	0ms	EAS Desktop 2016	2019-12-03 15:18:13	
gpl14	W065	HDX - Desktop	Active	TOPDE30606	10.97.45.66	19.9.0.21	119.2s	0ms	0ms	EAS Desktop 2016	2019-12-03 15:17:40	
gpl15	W14	HDX - Desktop	Active	SATP-BYSPW01	10.12.21.43	18.9.0.19526	37s	0ms	0ms	Braci 2016 Desktop	2019-12-03 15:17:10	
gpl16	gpl05	HDX - Desktop	Active	SATP-BYSPW01	10.12.21.43	18.9.0.19526	37.7s	0ms	0ms	Dev	2019-12-03 15:15:42	
gpl17	W076	HDX - Desktop	Active	SATL-B0RGL32	10.207.134.10	14.8.0.1010	42.2s	142ms	157ms	Insurance Desk 2016	2019-12-03 15:15:40	
gpl18	W025	HDX - Desktop	Active	CEN180-E7470	192.168.0.171	14.11.0.17061	20.6s	0ms	0ms	EAS Desktop 2016	2019-12-03 15:15:09	
gpl19	W020	HDX - Desktop	Active	LAPN40D6022	10.190.42.148	14.8.0.1010	34.9s	0ms	0ms	EAS Desktop 2016	2019-12-03 15:15:01	
gpl20	W024	HDX - Desktop	Active	Yuyang's MacBook P	192.168.0.160	19.10.0.13	13.3s	0ms	0ms	EAS Desktop 2016	2019-12-03 15:15:00	
gpl21	W124	HDX - Desktop	Active	Genevieve's MacBook	192.168.0.11	19.1.0.8	137.6s	0ms	0ms	EAS Desktop 2016	2019-12-03 15:14:33	
gpl22	W060	HDX - Desktop	Active	SATP-BYSPW01	10.12.21.43	18.9.0.19526	36.6s	0ms	0ms	Insurance Desk 2016	2019-12-03 15:14:13	
gpl23	W065	HDX - Desktop	Active	SATB-CRKGH2	10.12.22.42	19.9.0.21	16.6s	0ms	0ms	EAS Desktop 2016	2019-12-03 15:13:52	
gpl24	W026	HDX - Desktop	Active	David's MacBook Ai	192.168.0.101	19.10.2.41	67.4s	0ms	0ms	EAS Desktop 2016	2019-12-03 15:13:41	
gpl25	W043	HDX - Desktop	Active	SATL-HK1GRG2	10.12.21.35	19.9.0.21	17.1s	0ms	0ms	EAS Desktop 2016	2019-12-03 15:13:27	

- ▶ Identify the root cause of the user's logon duration slowness. This typically will either originate from the server side or the client side, but rarely both.

**Logon Summary**

Logon: **32.553 s**    Connect: 2019-12-03 14:12:43    Session Start: 2019-12-03 15:12:54    Session End: ---    Duration: 0h 11m 26s

**Logon Duration Brokering**

Delivery Controller Stages		Citrix Receiver Startup Stages	
Credentials Authentication:	0.129 s	Printer Creation:	0 s
Credentials Obtention:	0.016 s	Profile Load:	0 s
Credentials Obtention Network Server:	0 s	Program Neighborhood Cred Obtention:	0 s
Drive Mapping:	0.172 s	Session Creation:	9.552 s
Logon Script Execution:	0 s	Session Startup:	25.877 s
		Application Enumeration Client:	0 s
		Backup URL Client Count:	0 s
		Configuration Obtention Client Duration:	0 s
		Credentials Obtention Client:	0 s
		ICA File Download:	0 s
		Launch Page Web Server Duration:	0.157 s
		Name Resolution Client:	0 s
		Name Resolution Web Server:	0.094 s
		RECONNECT_ENUM_CLIENT:	0 s
		RECONNECT_ENUM_WEB_SERVER:	0 s
		STARTUP_CLIENT:	4.218 s
		Session Creation Client:	2.818 s
		Session Look-up Client:	0.001 s
		Ticket Response Web Server:	0.001 s

**Logon Stage Details**

Stage	Description	Start	Duration	Timeline
Brokering	Session brokering time	2019-12-03 14:12:29.433	0.017 s	8.142 s
Client Validation	Brokering and Endpoint Launch execution including launching the client	14:12:29.433	3.74 s	15.294 s
Server Validation	Server-side session validation time	14:12:29.433	3.727 s	24.426 s
HDX	HDX connection from client to VM	14:12:30.723	2.28 s	32.558 s
▶ Authentication	User authentication, Policy Retrieval, and logon script determination at the session host	14:12:49.248	0.125 s	
▼ GPO	Group Policy Execution	14:12:51.601	5.43 s	
	<b>Starting Registry Extension Processing.</b>	14:12:51.601	2.631 s	
	Name: Local Group Policy			
	Starting Citrix Group Policy Extension Processing. Local Group Policy[S24] Site Policies - AGICTXPROD-DCECTX.XA71 - User	14:12:52.429	0.168 s	
	Starting Folder Redirection Extension Processing. [S24] CTX - Redirection-DCE_V3	14:12:52.604	0.291 s	
	<b>Citrix Profile Management Extension</b>			
	Starting Citrix Profile Management Extension Processing.	14:12:52.905	0.016 s	
	Starting Internet Explorer Zonemapping Extension Processing. CTX - Internet Explorer 10	14:12:52.969	0.062 s	
	<b>Group Policy Drive Maps Extension</b>			
	Starting Group Policy Drive Maps Extension Processing. Name: CTX.XA71 - User Tuning	14:12:53.091	0.202 s	
	Starting Group Policy Folders Extension Processing. [S24] CTX - Profile Management-DCE_V3	14:12:53.348	0.117 s	
	Starting Group Policy Folder Options Extension Processing.	14:12:53.488	0.071 s	
	<b>Group Policy Scheduled Tasks Extension</b>			
	Starting Group Policy Scheduled Tasks Extension Processing. Name: CTX - Adobe Default	14:12:53.576	0.172 s	

- ▶ Once you identify the root cause of the issue, take action toward mitigating the issue (update / remove broken logon scripts, resolve incorrect drive mappings, or if client side, provide recommendations to the user on why they may be experiencing latency on their connection, etc.

Configure an automated report which will track the user's logons for a week. This will allow you to easily view the report and verify whether this user is still experiencing any logon duration slowness now that you've taken the appropriate actions.

## B. How to Troubleshoot Entire User Base Logon Duration Slowness:

Awareness:

- ▶ While this scenario sometimes provides a quicker/easier way to gain visibility into the root cause and resolve an issue, it also means that you have an issue impacting the entire organization. (All eyes are on you!) In this instance we will want to focus on configuring a report which can be sorted by the logon duration time. Once configured, we can see our entire user base and their logon durations sorted from highest to lowest.
- ▶ We can then spot check a sample group of users, which should help us in determining which stage the latency is occurring at, and at which point the high logon duration times are oriented for the users. Within Goliath Performance Monitor, you would then want to run a report which is sorted by stage to confirm the stage at which the problem is occurring.

Troubleshooting Process:

- ▶ Now that we are aware of the stage at which the issues are occurring across the user base, we can begin to troubleshoot the root cause of the problem. By viewing the logon duration report, we can now drill down into users' sessions and analyze exactly what activity is taking place. Based on your findings from the report, which was sorted by stage, you should already know which logon stage you need to identify the issue in.

**Citrix XenDesktop Session Logon Duration Report - Session Logon Duration (in Seconds) Report for Specified Period**

Reporting Period: Fri, January 01, 2016, 12:41 PM -- Sun, January 31, 2016, 12:41 PM Report Run: Tue, February 02, 2016, 12:48 PM Sort By: Machine Name

Machine Name	User Account Name	User Display Name	Connect D/T	Reconnect	Logon Duration Breakdown						Interactive	Group Name
					Logon	Client Valid	Auth	GPO	Scripts	Profile		
VDI-DEVCUSTA03	GOLIATH\Todd Matzelle	Todd Matzelle	2016-01-15 15:52:18.000	Yes	32.9	6.58	0.25			0.59	3.89	VDI - WIN7-CUSTA
VDI-DEVCUSTA03	GOLIATH\Todd Matzelle	Todd Matzelle	2016-01-15 11:10:33.000	Yes	35.4	3.39	0.23	6.06	0.25	0.25	3.95	VDI - WIN7-CUSTA
VDI-DEVCUSTA03	GOLIATH\Todd Matzelle	Todd Matzelle	2016-01-12 08:01:50.000	No	349.0	156.10	0.70	3.92		0.92	13.06	VDI - WIN7-CUSTA

Additional Logon Duration Details			
Action	Time	Duration	Details
Brokering	08:01:50.000	0.14 secs.	ZDC / DDC Broker: S:\R\XDDC03
Get Account Data	07:58:35.936725600	0.02 secs.	Account details: Account Name : CN=Todd Matzelle,OU=Goliath,DC=corp,DC=goliathtechnologies,DC=com Account Domain Name : CORP.GOLIATHTECHNOLOGIES.COM DC Name : \\S:\R-DDC02.corp.goliathtechnologies.com DC Domain Name : CORP.GOLIATHTECHNOLOGIES.COM
Domain Controller Data	07:58:35.936725600	0.97 secs.	Domain Controller details: Domain Controller Name : \\S:\R-DDC02.corp.goliathtechnologies.com Domain Controller IP Address : 10.10.20.30/6
LDAP Calls	07:58:37.699582100	0.02 secs.	List of applicable Group Policy objects: Local Group Policy
File Accessed	07:58:37.730783100	0.31 secs.	Making system calls to access specified file. \\corp.goliathtechnologies.com\sysvol\corp.goliathtechnologies.com\Policies\{318CF340-016D-11D2-945F-00C04FB964F9}\gpt.ini
Citrix Group Policy Extensions	07:58:39.353235100	0.22 secs.	Starting Citrix Group Policy Extension Processing. Local Group Policy
Citrix Profile Management Extension	07:58:39.587242600	0.17 secs.	Starting Citrix Profile Management Extension Processing.

Estimated network bandwidth on one of the connections: 1000000 kbps.  
A fast link was detected. The estimated bandwidth is 1000000 kbps. The slow link threshold is 500 kbps.

VDI-DEVCUSTA04	GOLIATH\Heather Hanlon	Heather Hanlon	2016-01-07 14:48:41.000	No	24.8	6.06	0.23			0.67	3.95	VDI - WIN7-CUSTA
VDI-DEVCUSTA05	GOLIATH\Floyd Roberts	Floyd Roberts	2016-01-26 15:23:05.000	No	16.8							VDI - WIN7-CUSTA
VDI-DEVCUSTA05	GOLIATH\Floyd Roberts	Floyd Roberts	2016-01-22 14:53:47.000	Yes	11.2							VDI - WIN7-CUSTA
VDI-DEVCUSTA05	GOLIATH\Floyd Roberts	Floyd Roberts	2016-01-19 16:26:26.0000-9:00	No	12.6	6.58	0.25			0.59	3.89	VDI - WIN7-CUSTA
VDI-DEVCUSTA05	GOLIATH\Floyd Roberts	Floyd Roberts	2016-01-20 09:09:44.000	No	12.6	6.58	0.25			0.59	3.89	VDI - WIN7-CUSTA

Report on Citrix XenApp & XenDesktop Logon Duration breakdown for real and simulated end users

- ▶ Once you locate the exact problem, for example, there was a logon script which wasn't necessary, you can then make the appropriate adjustments which will fix the issue and remove the problematic logon script.
- ▶ Using a test account configured with the same baseline as your typical user would be, apply the fix to your test user, and launch a few test sessions. Once you have launched a few sessions, you can then use the XA / XD session display within Goliath Performance Monitor to confirm the fix has worked as expected, and the issue is in fact resolved.
- ▶ Once resolution is tested and confirmed, you can apply the fix to the remainder of your user base so the issues they have been experiencing will be fixed.
- ▶ To confirm the issue doesn't persist after the fix has been implemented, we would then recommend configuring a daily report which runs every morning (perhaps at 9 AM, so you can review while having your second cup of coffee.) This report will allow you to easily track and verify that the issue has been resolved over the course of the days following the aforementioned fix being implemented.

## Use Cases – How Goliath Customers Use the Technology

In working with customers and helping them troubleshoot logon slowness, we have seen a number of different ways in which slowness manifests. The following use cases illustrate the most common ones we have seen customers encounter, and include how they used Goliath Performance Monitor to resolve their condition.

### Logon Slowness due to Drive Mapping Execution

#### Issue:

A global retailer's end users were experiencing logon times exceeding 5 minutes. Prior to using Goliath Technologies logon duration breakdown, they had been investigating, and attempting to manually find the root cause of this issue.

The process which the retailer's system engineers used was to first schedule a time with the end user(s) experiencing the problem, and they would conduct a remote session and attempt to manually time each stage of a user's logon as they watched the user log in. This troubleshooting process wasn't very successful, and the issues persisted for nearly eight months.

#### Resolution:

Once the Goliath Performance Monitor was implemented into their Virtual Apps environment, the team of engineers was able to easily gain the visibility into the root cause of the issue in real time, using the Logon Duration report. By drilling into sessions for users complaining of a slow logon process, they were able to determine the issue was actually due to drive mapping (logon) scripts.

These scripts were, in turn, mapping 30+ errant drives to the user's profile. The retailer's engineers were able to reduce the number of logon scripts down to a single script and removed the problematic as well as incorrectly linked GPOs. In the end, by determining the root cause and applying the aforementioned actions in their environment, the system engineers were able to reduce logon times down to an average of 45 seconds.

User 1 | InUse | VDI-CWIN10MF03

Summary | Logon | ICA/HDX | vGPU | VDI Server | Hypervisor Host | Apps/Processes | Alerts/Logs

Group Name: Windows 10 MCS Floating | Client Address: 10.20.67.99 | Hypervisor Host: 10.20.20.104  
 Broker Name: SVR-XDDC01 | Version: 19.9.0.21

**Logon Summary**  
 Logon: 288.4 s | Connect: 2019-11-27 13:03:32 | Session Start: 2019-11-27 13:04:05 | Session End: --:-- | Duration: 0h 2m 1s

**Logon Duration Brokering**

Delivery Controller Stages		Citrix Receiver Startup Stages	
Credentials Authentication: 0.39 s	Printer Creation: 0 s	Application Enumeration Client: 0 s	Name Resolution Web Server: 0.907 s
Credentials Obtain: 0 s	Profile Load: 180.2 s	Backup URL Client Count: 0 s	RECONNECT_ENUM_CLIENT: 0 s
Credentials Obtain Network Server: 0 s	Program Neighborhood List Obtain: 0 s	Configuration Obtain Client Duration: 0 s	RECONNECT_ENUM_WEB_SERVER: 0 s
Drive Mapping: 0.422 s	Session Creation: 1.046 s	Credentials Obtain Client: 0 s	STARTUP_CLIENT: 17.167 s
Logon Script Execution: 30.329 s	Session Start-up: 12.7 s	ICA File Download: 0 s	Session Creation Client: 3.518 s
		Launch Page Web Server Duration: 1.938 s	Session Look-up Client: 0.001 s
		Name Resolution Client: 0 s	Ticket Response Web Server: 0.001 s

**Logon Stage Details**

Stage	Description	Start	Duration	Timeline
Brokering	Session brokering time	2019-11-27 13:03:13.303	0.617 s	70.0 %   140.2 s   215.0 %   288.4 s
Client Validation	Brokering and Endpoint Launch execution including launching the client	13:03:13.303	19.674 s	
Server Validation	Server-side session validation time	13:03:13.303	19.81 s	
Authentication	User authentication, Policy Retrieval, and logon script determination at the session host	13:03:52.367	0 s	
GPO	Group Policy Execution	13:03:53.966	190.2 s	
Profile	User Profile loading	13:03:37.253	15.107 s	

---

User 1 | InUse | VDI-CWIN10MF03

Summary | Logon | ICA/HDX | vGPU | VDI Server | Hypervisor Host | Apps/Processes | Alerts/Logs

Stage	Description	Start	Duration	Timeline
Brokering	Session brokering time	2019-11-27 13:03:13.303	0.617 s	70.0 %   140.2 s   215.0 %   288.4 s
Client Validation	Brokering and Endpoint Launch execution including launching the client	13:03:13.303	19.674 s	
Server Validation	Server-side session validation time	13:03:13.303	19.81 s	
Authentication	User authentication, Policy Retrieval, and logon script determination at the session host	13:03:52.367	0 s	
GPO	Group Policy Execution	13:03:53.966	11.66 s	
	Starting Registry Extension Processing	13:03:53.966	0.078 s	
	Name: Win 10 VDA Settings			
	Starting Citrix Group Policy Extension Processing. Local Group Policy/Local Group Policy	13:03:54.045	0.314 s	
	Starting Folder Redirection Extension Processing. Win 10 VDA Settings	13:03:54.364	9.083 s	
	Citrix Profile Management Extension	13:04:03.450	0.078 s	
	Starting Citrix Profile Management Extension Processing			
	Group Policy Drive Maps Extension	13:04:03.535	180.6 s	
	Starting Group Policy Drive Maps Extension Processing			
	Name: VDI Drive Mappings			
	List of applicable Group Policy objects:			
	Name: Local Group			
	The following Group Policy objects were not applicable because they were filtered out:			
Profile	User Profile loading	13:03:37.253	15.107 s	
Interactive Session	Background processing for completing the load of the user's environment	13:03:52.360	15.443 s	

Estimated network bandwidth on one of the connections: 28470427 kbps.  
 A fast link was detected. The Estimated bandwidth is 227763 kbps. The slow link threshold is 500 kbps.

# AD Group Membership/Logon Script/Registry Extension Mappings Causing Logon Slowness

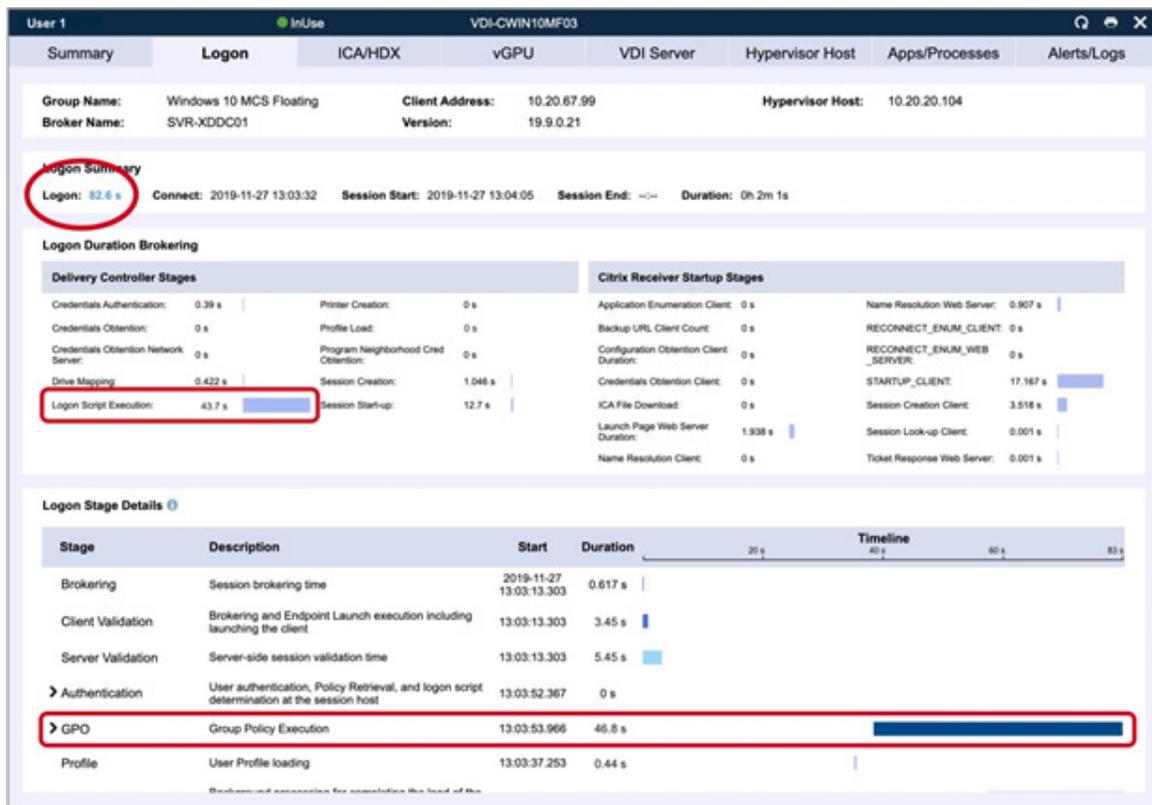
## Issue:

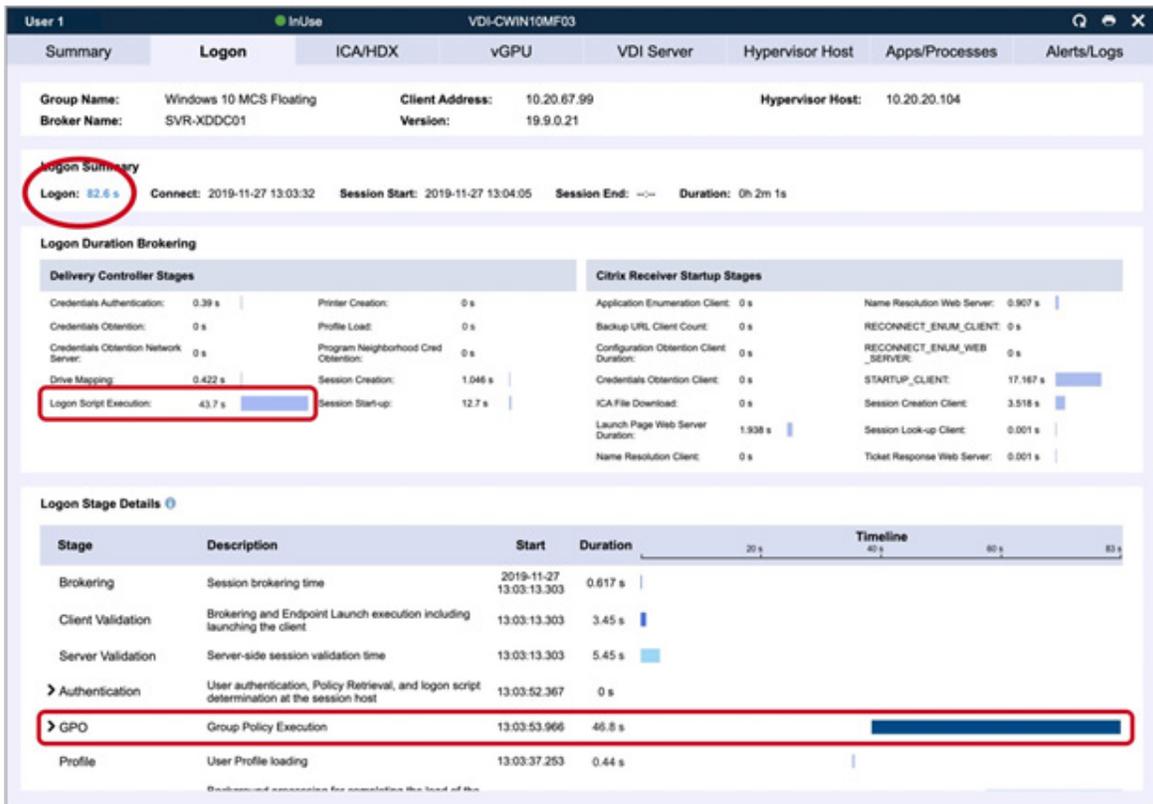
A leading law firm based out of New York City, was experiencing logon duration problems impacting the end user performance for their remote workforce of attorneys. Without the visibility into what actually was the root cause of the issue, the law firm's system administrators found themselves playing pin the tail on the donkey, and not knowing where to begin.

## Resolution:

Once the Goliath Performance Monitor was installed in their environment, the systems administrators were able to leverage the logon duration report, drill down into a the logon duration breakdown for a few spot checked users, and determined that there were logon scripts being applied to incorrect user groups.

The users in these respective AD groups didn't require or have access to applications which the respective logon scripts had been attempting to map. Additional registry extensions were also being applied to the user groups which was extending the logon duration. By removing the keys for the users who didn't require this access, logon duration times were lowered by more than 40 seconds.





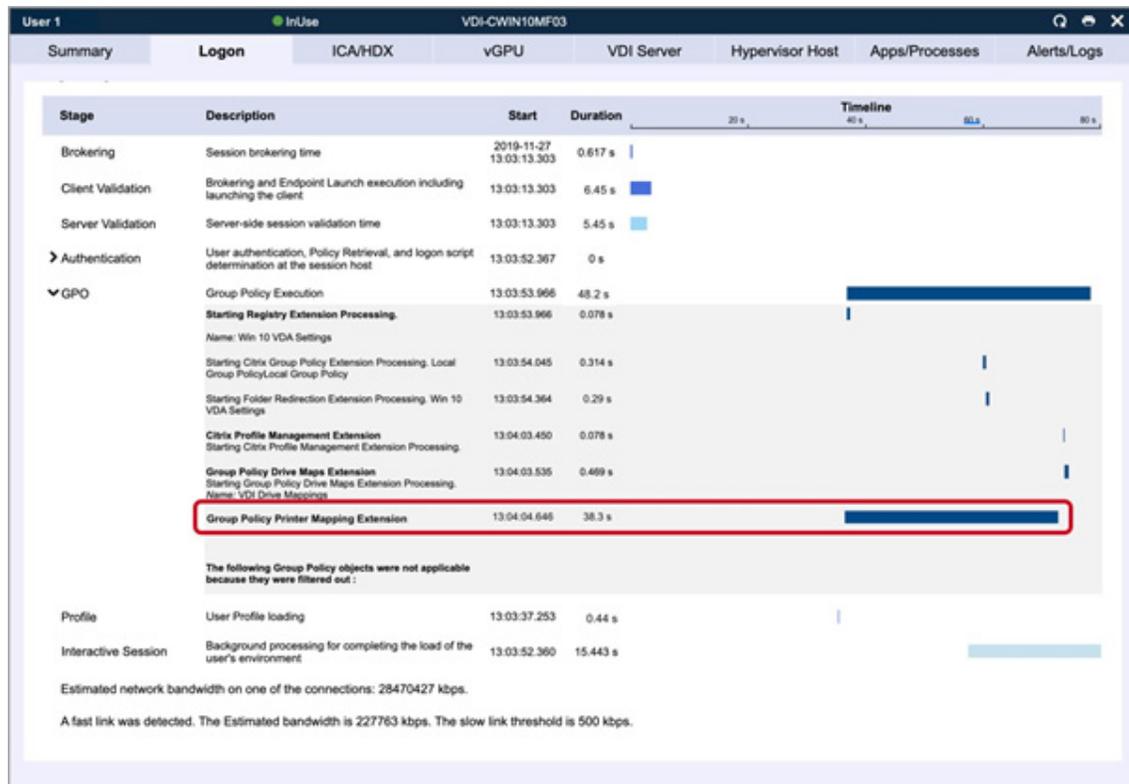
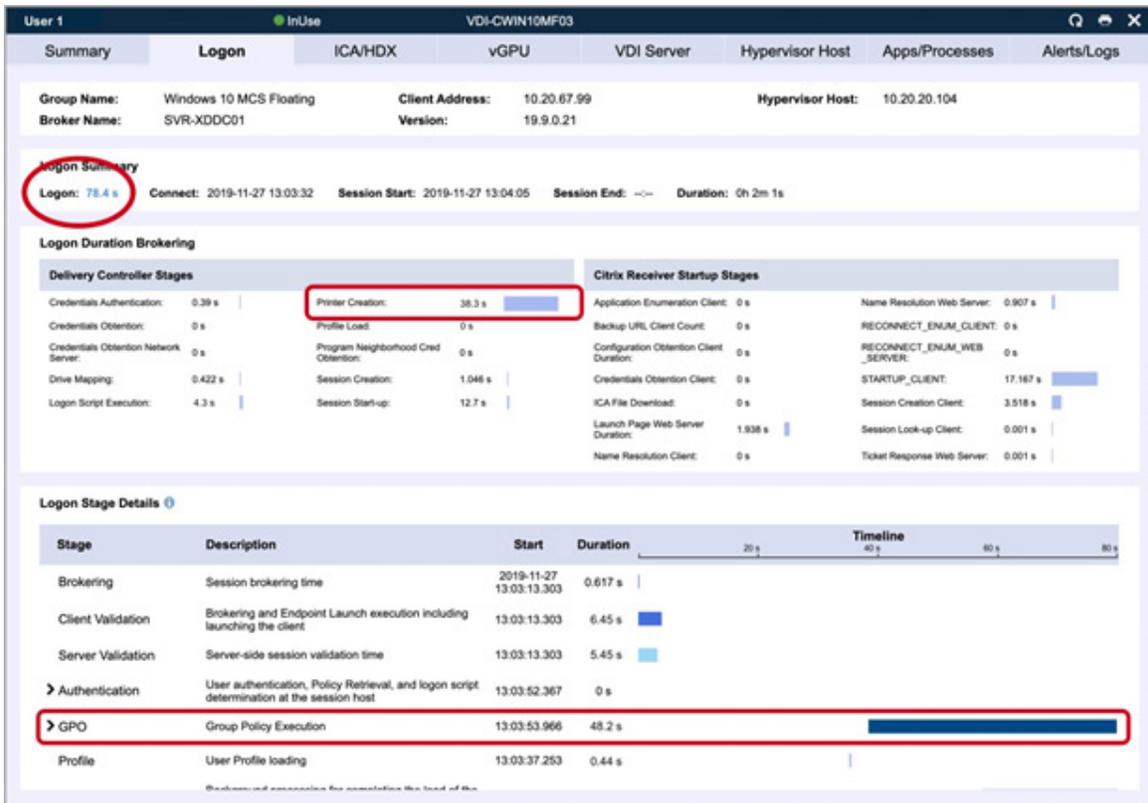
## Print Driver Support and Missing Print Drivers Causing Long Logons

### Issue:

An engineering firm with an expansive remote work force utilizing Virtual Apps and Desktops had an increasingly high number of users complaining of long logon times. While inconsistent, the logon duration times were directly impacting the end users' ability to perform their duties while working remotely.

### Resolution:

With the help of Goliath Performance Monitor, the Citrix team was able to determine printer mapping was exceeding the normal thresholds they would expect. This was due in fact that there were print drivers missing and/or unsupported by Citrix. In turn, this caused long delays in the logon times primarily when the end users were working from home, or a remote site location. The Citrix engineering team was able to install/update any problematic print drivers which required such driver changes, and then configure a policy which would block any unsupported printers from being mapped to their users' desktops/applications.



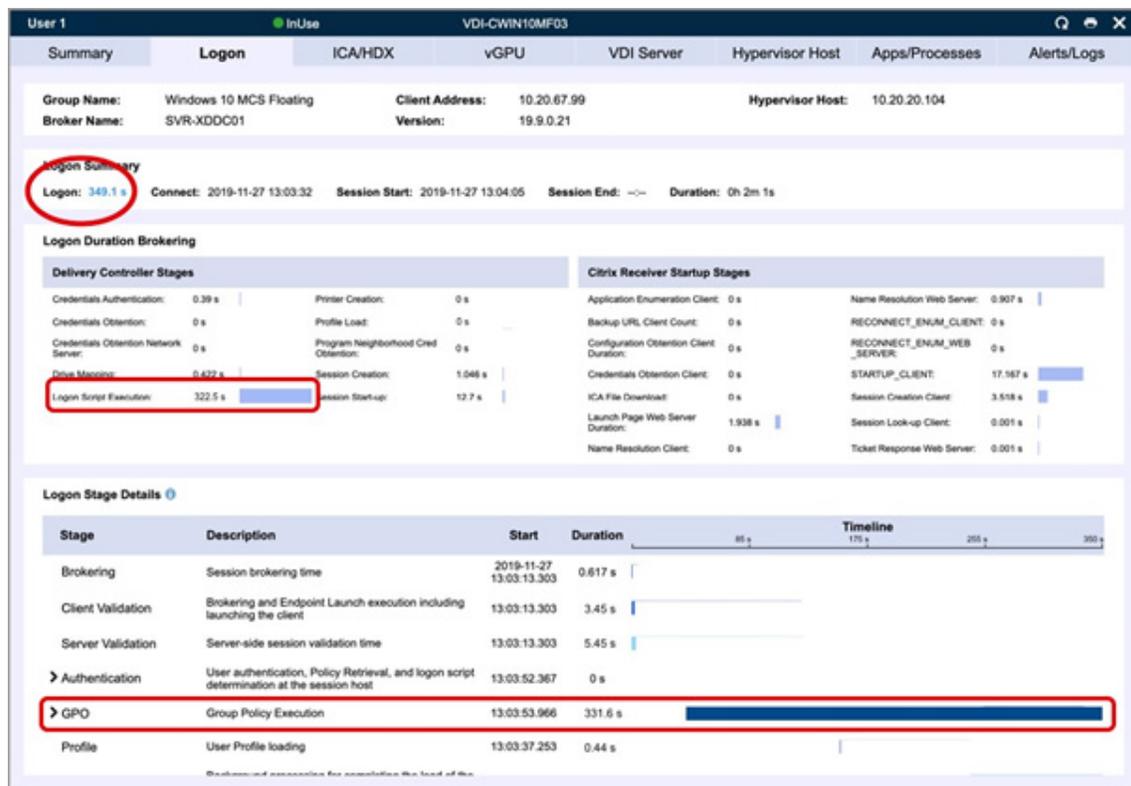
# Logon Script Improperly Coded

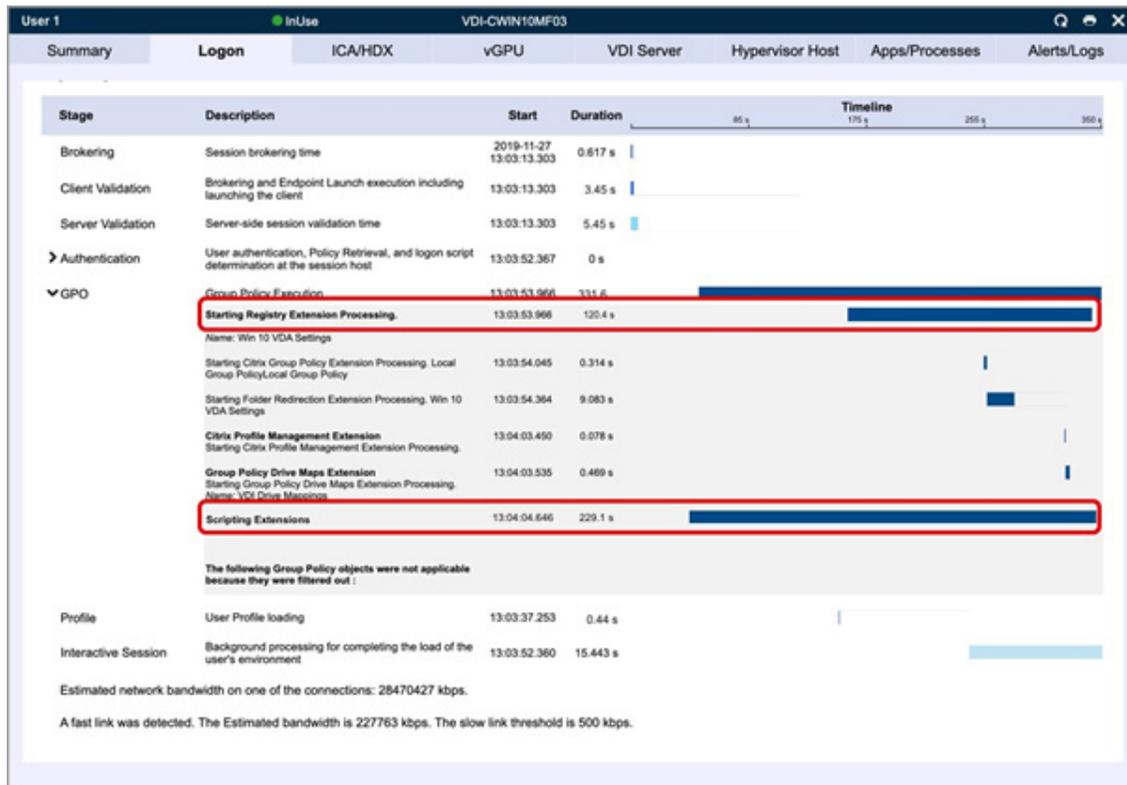
## Issue:

Providers and nurses at a large healthcare organization were experiencing longer than normal logon times, especially when first starting their shift on the ICU floors. Prior to working with Goliath Technologies, the issue was causing frustration with the employees, as well as directly impacting the patient care itself.

## Resolution:

Once Goliath Performance Monitor was implemented and configured, the IT infrastructure team was able to determine there were improperly coded logon scripts being applied to the ICU team, which had been delaying logons. As these scripts didn't execute properly, they would eventually time out, but they took 60 seconds to do so. Not only were the staff receiving application level issues due to the scripts not "kicking off" properly, the excessive timeout period was taking 60 seconds for each script to "fail/quit." The logon duration was increased at times in excess of 6 minutes, however once the script related issues were mitigated, logon times averaged out to 37 seconds.





## Summary

As you can see, the Citrix Logon Process is a very complex set of technical hand offs between 33 different stages, with some of them being inter-dependent. It really is quite an amazing technical feat.

To truly be proactive and get ahead of logon issues before end users complain, it is important to have a real time, granular drill down into each of the stages, along with an understanding of how to utilize them. In addition, because we need objective evidence from time to time so we can defend Citrix, or show the true root cause, it is critical to have robust out-of-the-box reporting.

Goliath Performance Monitor is, in essence, a comprehensive logon duration monitoring, alerting, and analysis technology. Goliath Performance Monitor delivers each of the features you will need to encompass the troubleshooting needs in a Citrix environment.

# Schedule A Demo Or Download a Free 30-Day Trial of Goliath Performance Monitor

Includes Full Support from Goliath Tech Ops

## About the Authors

---

### George Spiers



George has been a Citrix Technology Professional (CTP) since 2018 and is also a Citrix Certified Expert in Virtualization (CCE-V), a Citrix Certified Professional in Networking (CCP-N), a Microsoft Certified Solutions Expert and an Epic Certified Administrator. He has experience working with Citrix NetScaler, PVS, XenApp, XenDesktop and XenServer leveraging NVIDIA GRID technology for high-end graphical computing.

### Goliath Technical Support Team



Our technical support team leverages their collective decades of Citrix experience and expertise in monitoring and troubleshooting end-user experience issues with the express purpose of assisting the IT professional. In addition to supporting our customers and providing critical feedback and insights to our product management and development teams, they also author helpful technical guides and share tips via our webinar and blog series.

**Goliath Technologies**  
**(855) 465-4284**  
**techinfo@goliathtechnologies.com**  
**www.goliathtechnologies.com**

Version: 20220117  
©2022 Goliath Technologies. All Rights Reserved