Connectivity: Troubleshoot DB Availability and Connection Errors

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Intro

This section covers troubleshooting guides for Connectivity and availability related problems. These problems can be caused by reconfiguration, firewall settings, a connection timeout, incorrect login information or failure to apply best practices and design guidelines during the application design process, resource health issues and additionally if maximum limit on some Azure SQL Database resources is reached, user can experience connection issues.

Heath Proble Status

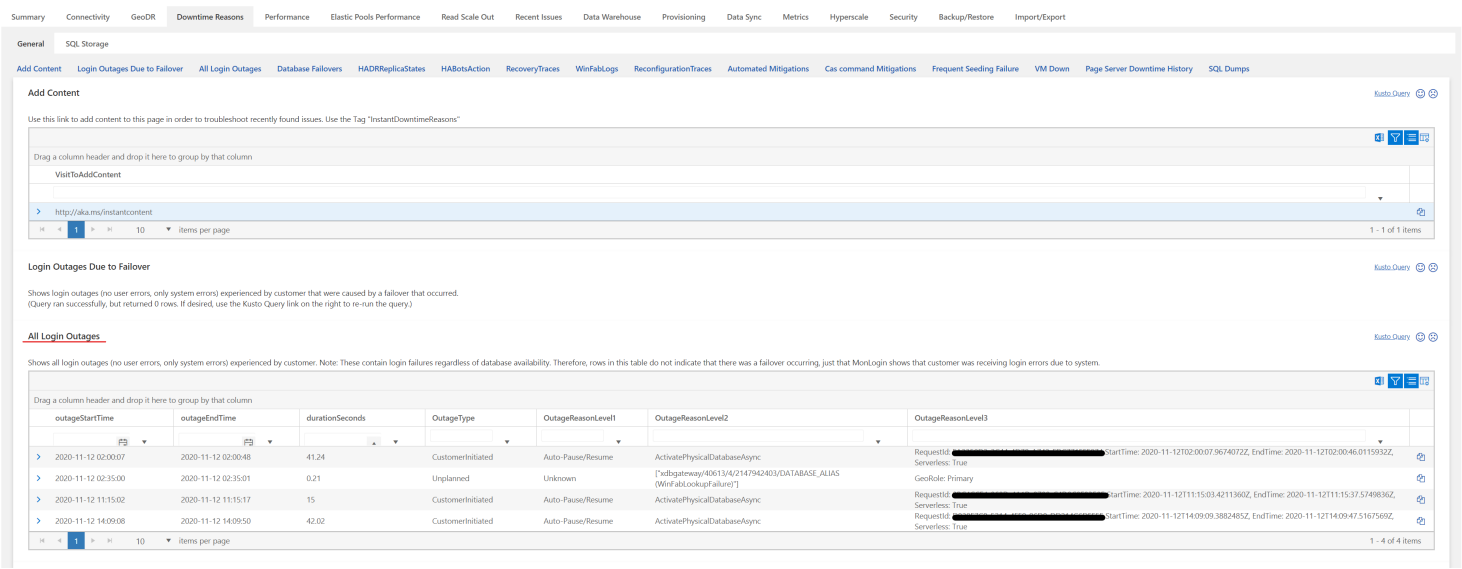
https://portal.microsoftgeneva.com/dashboard/slbv2prod/AzureMonitor/DipAvailability_HealthProbeStatus

Troubleshooting

When you receive a case regarding connectivity or availability, you will firstly open ASC to check details.

Downtime Reasons in ASC

In **"Downtime Reasons"** tab, there is a section **"All Login Outages"** to show what happens on the database that impact availability. By looking into the table, we hope you can understand most common scenarios and provide the RCA without raising an incident to product team.



Diffrent Outage Types

1. Planned – planned failover due to deployments or reconfigurations
2. Unplanned – Any unplanned failover or LoginOutages doesn't know the cause (this usually has OutageReasonLevel1 as "Unknown")
3. ResourceBalancing – Actions taken when we detect resource issues from backend
4. CustomerInitiated – Actions that are triggered by customer like update SLOs, Geo Failover, Auto-Pause/Resume for serverless DBs etc.

Explanation of All Login Outages

For scenarios not listed, we may still need an ICM to understand full RCA like SQL Dump issues or OOM issues.

Outage Type	OutageReasonLevel1	OutageReasonLevel2	E
Unplanned	HighCpuDueToSecurityCache	< LSI/ICM # with Impact	L u
Unplanned	DeploymentBotAction	RestartNode	
Unplanned	CAS	RestartReplica	Y " ir
Unplanned	DeploymentBotAction	RestartCodePackage	
Unplanned	CAS	KillProcess	F c p h C ir w tl

Outage Type	OutageReasonLevel1	OutageReasonLevel2	E
ResourceBalancing	Update SLO	UpdateLogicalDatabase	
ResourceBalancing	Update SLO	Update SLO on logical master	(I t d
ResourceBalancing	ResourceLevelLoadBalancing	ActivatePhysicalDatabaseAsync	(I lo s th d a n th in it
ResourceBalancing	ResourceLevelLoadBalancing	DeactivateDatabaseAsync	
ResourceBalancing	ResourceLevelLoadBalancing	DeactivateDatabaseAsyncOnLogicalMaster	
ResourceBalancing	PLB	QuickLoadBalancing	
ResourceBalancing	PLB	AppMemoryUsageMB	

Outage Type	OutageReasonLevel1	OutageReasonLevel2	E
ResourceBalancing	PLB	InstanceDiskSpaceUsed	
ResourceBalancing	PLB	AppCpuUsage	
ResourceBalancing	PLB	LoadBalancing	
ResourceBalancing	PLB	ConstraintCheck	

Outage Type	OutageReasonLevel1	OutageReasonLevel2	E
ResourceBalancing	PLB	MaxCpuUsage	
Planned	Deployment	Upgrade	
CustomerInitiated	Update SLO	UpdateLogicalDatabase	
CustomerInitiated	Update SLO	UpdateLogicalElasticPool	
CustomerInitiated	Geo Failover	ResumeAfterPlannedGeoFailover	
CustomerInitiated	FailoverApi	Database	
CustomerInitiated	FailoverApi	ElasticPool	

Outage Type	OutageReasonLevel1	OutageReasonLevel2	E
CustomerInitiated	DisabledDatabase		T t s
CustomerInitiated	DatabaseCreation	CreateLogicalDatabase	
CustomerInitiated	Auto-Pause/Resume	ActivatePhysicalDatabaseAsync	
CustomerInitiated	Auto-Pause/Resume	DeactivateDatabaseAsync	

Additional steps to check when you see OutageType as "Unplanned" and OutageReasonLevel1 as "Unknown"

When you see OutageType as "Unplanned" and OutageReasonLevel1 as "Unknown", it means the login outage pipeline is unable to identify what causes the issue. Additionally, you can go to database replicas.xts and use "Downtime Reasons" tab to see if the login outage is caused by any backend issues.

Here is an example output you see from ASC:

All Login Outages

Kusto Query

Shows all login outages (no user errors, only system errors) experienced by customer. Note: These contain login failures regardless of database availability. Therefore, rows in this table do not indicate that there was a failover occurring, just that MonLogin shows that customer was receiving login errors due to system.

Drag a column header and drop it here to group by that column

outageStartTime	outageEndTime	durationSeconds	OutageType	OutageReasonLevel1	OutageReasonLevel2	OutageReasonLevel3
2021-01-31 22:50:10	2021-01-31 22:59:55	585.01	Unplanned	Unknown	["sqlserver/40613/129 (FindLoginForContainedDBAuthUnexpectedFailure)"]	GeoRole: GeoPrimary
2021-01-31 22:59:55	2021-01-31 23:14:16	861.34	Unplanned	Unknown	["sqlserver/40613/129 (FindLoginForContainedDBAuthUnexpectedFailure)"]	GeoRole: GeoPrimary
2021-01-31 23:16:32	2021-01-31 23:41:31	1498.95	Unplanned	Unknown	["sqlserver/40613/129 (FindLoginForContainedDBAuthUnexpectedFailure)","xdbhost/40613/10 (CantFindRequestedInstance)","xdbhost/40613/13 (FailedToSendDuplicateData)"]	GeoRole: GeoPrimary
2021-02-01 03:18:01	2021-02-01 03:18:26	25.09	Unplanned	Unknown	["sqlserver/40613/129 (FindLoginForContainedDBAuthUnexpectedFailure)"]	GeoRole: GeoPrimary

1 - 4 of 4 items

From XTS, you can see the failover is planned failover due to deployment.

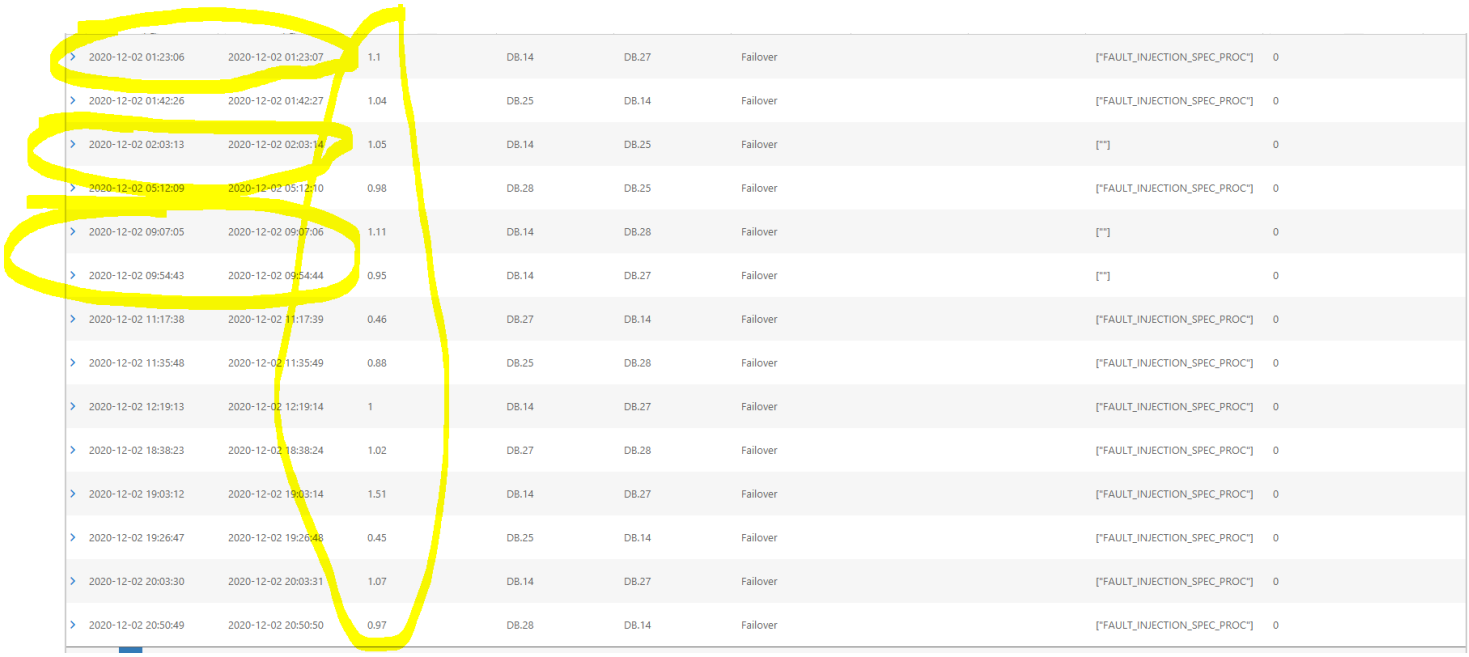
Downtime Reasons

Outage Start Time	Outage End Time	Outage Time In Seconds	Type	PLB Activity	New Primary	Old Primary	Outage Reason	Ar
1/29/2021 10:19:58 PM	1/29/2021 10:37:42 PM	15	Planned Failover	["MovePrimary:ConstraintCheck InstanceDiskSpaceUsed"]	DB.15	DB.61	Load Balancing	
1/31/2021 10:27:45 PM	1/31/2021 11:39:54 PM	3077	Planned Failover	["MovePrimary:QuickLoadBalancing ",""]	DB.61	DB.15	Load Balancing	
2/1/2021 3:09:28 AM	2/1/2021 3:18:15 AM	527		["MovePrimary:ConstraintCheck InstanceDiskSpaceUsed"]	DB.46	DB.61	Load Balancing	
2/1/2021 10:00:23 PM	2/1/2021 10:00:48 PM	12	Planned Failover	["SwapPrimarySecondary:Upgrade "]	DB.47	DB.46	Deployment	
2/1/2021 10:36:47 PM	2/1/2021 10:42:26 PM	18	Planned Failover	["SwapPrimarySecondary:Upgrade "]	DB.46	DB.47	Deployment	
2/2/2021 3:22:28 AM	2/2/2021 3:23:00 AM	2	Planned Failover	["MoveSecondary:ConstraintCheck ","MovePrimary:ConstraintCheck "]	DB.55	DB.46	Load Balancing	

How to troubleshoot multiple failovers?

Similar to single failover, you need to follow ASC to check downtime reasons. But most customers will ask why they are expering so many failovers and are concerned about the impact, so there are a few tips when handling multiple failovers.

1. Identify the failover duration for each failover. Most failovers should happend very short around 1 second.



2020-12-02 01:23:06	2020-12-02 01:23:07	1.1	DB.14	DB.27	Failover	["FAULT_INJECTION_SPEC_PROC"]	0
2020-12-02 01:42:26	2020-12-02 01:42:27	1.04	DB.25	DB.14	Failover	["FAULT_INJECTION_SPEC_PROC"]	0
2020-12-02 02:03:13	2020-12-02 02:03:14	1.05	DB.14	DB.25	Failover	[""]	0
2020-12-02 05:12:09	2020-12-02 05:12:10	0.98	DB.28	DB.25	Failover	["FAULT_INJECTION_SPEC_PROC"]	0
2020-12-02 09:07:05	2020-12-02 09:07:06	1.11	DB.14	DB.28	Failover	[""]	0
2020-12-02 09:54:43	2020-12-02 09:54:44	0.95	DB.14	DB.27	Failover	[""]	0
2020-12-02 11:17:38	2020-12-02 11:17:39	0.46	DB.27	DB.14	Failover	["FAULT_INJECTION_SPEC_PROC"]	0
2020-12-02 11:35:48	2020-12-02 11:35:49	0.88	DB.25	DB.28	Failover	["FAULT_INJECTION_SPEC_PROC"]	0
2020-12-02 12:19:13	2020-12-02 12:19:14	1	DB.14	DB.27	Failover	["FAULT_INJECTION_SPEC_PROC"]	0
2020-12-02 18:38:23	2020-12-02 18:38:24	1.02	DB.27	DB.28	Failover	["FAULT_INJECTION_SPEC_PROC"]	0
2020-12-02 19:03:12	2020-12-02 19:03:14	1.51	DB.14	DB.27	Failover	["FAULT_INJECTION_SPEC_PROC"]	0
2020-12-02 19:26:47	2020-12-02 19:26:48	0.45	DB.25	DB.14	Failover	["FAULT_INJECTION_SPEC_PROC"]	0
2020-12-02 20:03:30	2020-12-02 20:03:31	1.07	DB.14	DB.27	Failover	["FAULT_INJECTION_SPEC_PROC"]	0
2020-12-02 20:50:49	2020-12-02 20:50:50	0.97	DB.28	DB.14	Failover	["FAULT_INJECTION_SPEC_PROC"]	0

Usually for client which impletements retry logic, 1 second failover duration wouldn't cause big impact to their business.

2. Identify if customer's business is impacted badly by checking from Kusto. If there is successful connections to the database right after the failover time in MonLogin, it means client is able to resume the connection to database.

3. Check the root cause of failovers and explain them to customer carefully.

   Additional RCA for multiple failovers caused by Azure

   To avoid many kinds of issue like Bad Node, corrupted pages or compete for resources cause bigger business impact, the Azure infrastructure has mechanisms to check the health automatically and avoid those issues through failover.

How good have you found this content?