

Error 9001 - The log for database 'X' is not available

Last updated by | Holger Linke | Feb 28, 2023 at 1:07 AM PST

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Issue

The customer connections and queries are failing unexpected, and the following error is logged by the application:

Error: 9001, Severity: 21, State: 16.

The log for database 'databasename' is not available. Check the operating system error log for related error messages. Resolve any errors and restart the database.

Investigation / Analysis

Error 9001 occurs when the database transaction log file becomes unavailable to the SQL service. The error only shows the end result, but doesn't explain what had led to this state.

When an Azure SQL Database log file goes offline, it usually means that the Azure fabric has cut the access to the file for management reasons like: upgrade maintenance, load balancing, scaling, unhealthy node. But like in on-premise SQL Server, it could also mean that a serious failure had occurred which prevents transactions in the database.

Check ASC for reconfigurations and failovers

Create an ASC troubleshooter report for the time when the error 9001 had occurred. Check the Insights and the "Downtime Reasons" page. If you can see any scaling operation or reconfiguration, either planned or unplanned, then this explains the error 9001.

During a reconfiguration, error 9001 may be thrown for a very small period of time, because the database on the old node needs to be quiesced before transferring the file access to the new node. Therefore, if the source database log file was offline during a part of a reconfiguration, it is to be expected and by design.

The reconfiguration itself could have been caused by a health issue though. Check the other information in ASC to identify the exact reason.

Check Kusto for related errors

You can also check the Kusto telemetry directly to see if there were any other errors shortly before or after the 9001. These might confirm the reconfiguration, but may surface any other, more serious issues:

```
// explicitly-reported errors
let srv = "servername";
let db = "databasename";
let startTime = datetime(2023-02-22 04:00:00Z);
let endTime = datetime(2023-02-22 05:00:00Z);
let timeRange = ago(1d);
AlrSQLErrorsReported
| where TIMESTAMP >= startTime
| where TIMESTAMP <= endTime
//| where TIMESTAMP >= timeRange
| where LogicalServerName =~ srv
| where database_name =~ db
//| where error_number in (823, 1101, 1105, 3314, 9001, 9002)
| project originalEventTimestamp, database_name, AppName, NodeName, error_number, severity, state, category, d
| limit 1000
```

Sample output:

originalEventTimestamp	database_name	AppName	NodeName	error_number	severity	state	
2023-02-22 04:05:12.4881216	databasename	e98f49645d47	_DB_4	9001	21	4	
2023-02-22 04:20:57.5672464	databasename	f909ac0f0656	_DB_5	1101	17	12	(insuffic

In this case, the errors confirm the failover: the AppName and the NodeName have both changed, pointing to a scaling operation as the likely cause. Use ASC to confirm.

Also see [Creating large indexes](#) for a similar scenario and additional considerations.

Mitigation

Error 9001 caused by reconfiguration

If you have confirmed that the error 9001 was related to a reconfiguration, then use the following RCA as a template. Also use any the RCA details from ASC to provide information about why the reconfiguration had been triggered.

RCA

During a reconfiguration, caused by events like scaling or planned maintenance, error 9001 may be thrown for a very small period of time on source database because log file was offline during part of reconfiguration, which is by design. When switch between source and destination database happens, source database log is taken offline. This does not cause any unavailability of your databases. We apologize for the inconvenience and we will continue giving our best on improving our product.

Error 9001 caused by a health issue

Open an IcM if the issue occurred longer than the failover or had even started before the reconfiguration, and ASC doesn't give a valid reason. Also go for an IcM if the issue occurs repeatedly and outside of a reconfiguration, and if it might be pointing to a possible health issue.

Root Cause Classification

Cases resolved by this TSG should be coded to one of the options under Azure SQL v3/Availability/Planned Failovers

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