API Gateway

Debugging and cleanup of opsdb.d corruption

1. Introduction

This guide describes the diagnosis of and recovery from opsdb.d corruption. Opsdb.d is a proprietary data format which stores the data for use by Traffic Monitor. This guide only applies to API Gateway version 7.2 and later. Older versions used an entirely different system for opsdb.d data that was based on sqlite. Further information on the internal structure of opsdb.d and the use of vtd can be found in the Opsdb.d internals document.

2. Causes of crashes & corruption

There are many possible ways that crashes may manifest or corruption may occur. A complete list is impossible, but a few of the times problems have been observed include:

- Crash during a query from Traffic Monitor for data stored in a corrupted opsdb.d.
- Crash when attempting to write an entry for new traffic to a corrupted opsdb.d.
- Corruption when the system or JVM is crashes or is otherwise shut down abnormally.
- Corruption and crash when the system runs out of disk space.
- Crash when the system is started up with a corrupted opsdb.d.
- Corruption and crash when an overly large transaction was added to opsdb.d.
- Corruption when only part of the opsdb.d data was deleted manually because it was "old."

In general, API Gateway support should be asked to determine if an issue looks like opsdb.d corruption. In order to debug an opsdb.d issues, it is necessary to gather all of the information listed in KB #177035, especially the core stack trace described in KB 163470:

https://support.axway.com/kb/177035/language/en

https://support.axway.com/kb/163470/language/en

It is necessary to provide a core and a core stack trace from the most recent SP of your version in order to ensure that our developers can resolve any corruption that was due to a bug in the product.

3. Known signs of opsdb.d corruption

Some of the known signs of opsdb.d issues include the following errors:

```
failed to flush dirty page to ops DB: No space left on device. : write
failed: cannot flush page {"file":2,"page":8}
```

This can occur when there is no room to write to opsdb.d, but the system is still able to write to the log files on a separate partition.

```
traffic monitor journal write failed: page {"file":36571,"page":1}
```

Errors like this have been observed when attempting to write very large individual transactions to opsdb.d. This was corrected in 7.5.3 SP2 and later versions.

```
traffic monitor journal write failed: invalid index file 5: cannot open index file 5
```

This has been observed when administrators manually deleted some large `.idx` files to free up disk space.

```
Vordel::AppendDB
Vordel::DBTrace
Vordel::CorrelationID
Vordel::DBAuditor
```

Core stack traces from SIGSEGVs on startup that contain any of the above calls typically indicate that opsdb.d has been corrupted.

```
traffic monitor journal write failed: The process cannot access the file
because it is being used by another process.
```

This is not actually opsdb.d corruption, it was included here because it's confusingly similar. This error can happen when attempting to start two Node Manager processes on the same host.

4. Recovery

Once you have properly identified an issue as being caused by a corrupted opsdb.d, the only way to recover it is to delete the instance's opsdb.d directory. This will result in the loss of all Traffic Monitor data for that node. Accordingly, this should only be done when strictly necessary. All of the files are linked, so it is not safe to delete only part of the data, the entire opsdb.d directory on the instance must be deleted. Deleting some, but not all, of the files has been observed to cause crashes. The correct procedure is as follows:

- Stop the instance.
- Remove the entire `/apigateway/groups/group-X/instance-Y/conf/opsdb.d/` directory for that instance.
- Restart the instance.

The gateway will recreate the opsdb.d directory during startup. In general, it is inadvisable to do this automatically, because it is not possible to automatically determine if a crash was caused by opsdb.d corruption.

5. References

How to report an API Gateway crash
https://support.axway.com/kb/177035/language/en

How to get a stack trace from a vshell core
https://support.axway.com/kb/163470/language/en

Traffic monitor journal write failed: invalid index file
https://support.axway.com/kb/177625/language/en