

Jake Manske



Diagnosing and fixing deadlocks in SQL Server


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About me

- PhD, mathematics from Iowa State in 2010
- Faculty at Texas State University until 2013
- Developing in SQL Server since 2013
- Epic – EHR and Analytics vendor in Madison, WI
- 0 years experience as a Microsoft MVP
- 0 years experience as a MCM
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- A decorative graphic consisting of several overlapping, curved teal shapes that form a stylized, abstract shape on the left side of the slide.
- Deadlock review
 - Deadlock diagnostics
 - Free tools
 - Deadlock XML anatomy
 - Resources

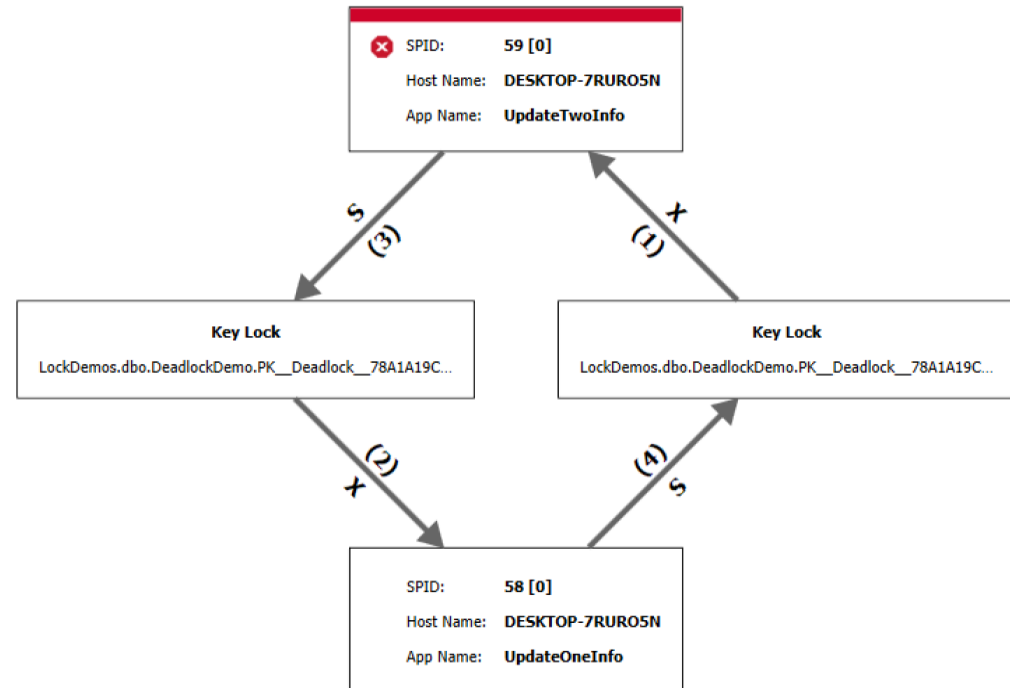
Agenda



Deadlock review

Deadlock review

- Deadlock is when two or more processes are waiting on one another before they can proceed
- There is no way to move forward without at least one session stepping aside
- It is not simply blocking



Deadlock review

- Deadlock manager checks every 5 seconds
 - Deadlock found: reduce interval by 100ms, check again
 - No deadlock found: increase interval by 100ms (max 5 seconds)



Deadlock review

- Which session is the “victim”?
 - The session with the lowest DEADLOCK_PRIORITY
 - Least amount of log records*
 - Theoretically is the least amount of work to rollback





Deadlock diagnostics

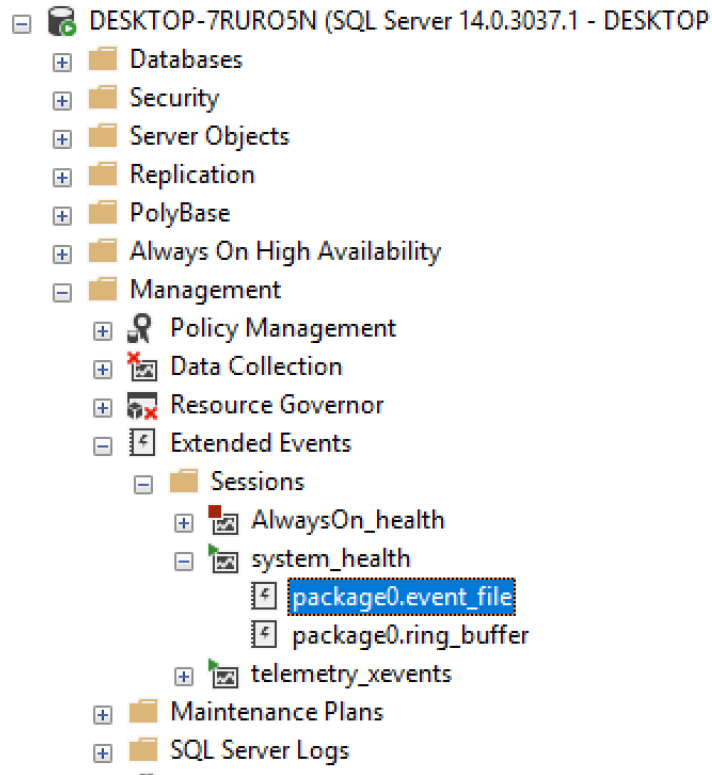
Deadlock diagnostics

- SQL Server 2012+
 - Do not use trace flags 1222 or 1204
 - Do not go hunting in the error log
 - Use the system_health extended event
 - Caveat: the XE is small and will roll over
 - Increase its size
 - Do not delay deadlock investigation



Deadlock diagnostics

system_health extended event



```
SELECT CAST(event_data AS xml).query(
    '(event/data[@name="xml_report"]/value/deadlock)[1]'
) AS deadlock_report
FROM sys.fn_xe_file_target_read_file(
    'system_health*xel', NULL, NULL, NULL
)
WHERE object_name = N'xml_deadlock_report';
```





Free tools

Free tools

- SentryOne Plan explorer (has deadlock XML interpreter)
- Notepad++ (for diving into XML)
- sp_BlitzLock (for summarizing all deadlock activity)





Deadlock XML anatomy

Deadlock XML anatomy

- transactionname – does it make sense?
- ecid – is it 0?
- isolationlevel – is it what you expect?
- clientapp – important for tracking down issues
- Execution stack
- trancount – not what you think





Resources

Resources

- So how do I fix stuff?
 - [DEADLOCK PRIORITY](#)
 - Only set sessions *lower*
 - [sp_getapplock](#)
 - Serialize access to resources
- Intraquery parallel deadlock is always MS bug
 - Workarounds include
 - MAXDOP 1 hint
 - Rewriting query to have fewer parallel zones





Thank you!

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