



Monitoring Privileged Access on SQL Server

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Preview of Key Points

- Privileged access in SQL Server
 - Authority model
 - Types of activities
- Auditing in SQL Server
- Auditing privileged access
 - Server operations
 - Database operations
 - Data access
 - Delegation
- Getting SQL audit data to your SIEM
- LOGbinder for SQL Server



Privileged access in SQL Server

- Roles
- Permissions



Privileged access in SQL Server

- Roles
 - Like groups in Windows
- Types
 - Server
 - Assigned server level permissions
 - Members
 - Logins
 - Server roles
 - Database
 - Assigned permissions to Database, Schema, Schema objects
 - Members
 - Database users
 - Database roles



Privileged access in SQL Server

- Permissions
 - Much like permissions on files in Windows
- Granted at levels
 - Server
 - Database
 - Schema

Privileged roles and permissions

- Fixed server and database roles
- <http://social.technet.microsoft.com/wiki/contents/articles/2024.database-engine-fixed-server-and-fixed-database-roles.aspx>

Auditing in SQL Server

- Define audit policy
 - Server level
 - From SQL Server 2012 onwards, available in all editions
 - Database level
 - Only available in Enterprise editions
- Audit specification
 - Action group
 - Object
 - Principal

Auditing privileged access

- Not about auditing
 - Application
 - End-user
- About auditing DB admins and other privileged users
- How not to audit everything
 - Audit infrequent privileged operations performed by all
 - Backup database
 - Manage DB encryption
 - Audit other significant actions performed by known admins
 - Direct queries or updates to important tables
 - Monitor delegation of privileged access
 - Permission changes
 - Role membership changes
 - Ownership changes

Server level operations

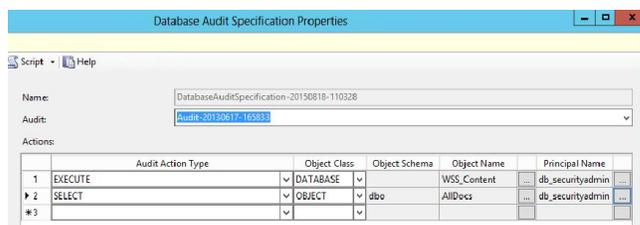
- Server level action groups to audit
 - APPLICATION_ROLE_CHANGE_PASSWORD_GROUP
 - AUDIT_CHANGE_GROUP
 - BACKUP_RESTORE_GROUP
 - LOGIN_CHANGE_PASSWORD_GROUP
 - SERVER_OBJECT_CHANGE_GROUP
 - SERVER_OBJECT_OWNERSHIP_CHANGE_GROUP
 - SERVER_OBJECT_PERMISSION_CHANGE_GROUP
 - SERVER_OPERATION_GROUP
 - SERVER_PERMISSION_CHANGE_GROUP
 - SERVER_PRINCIPAL_CHANGE_GROUP
 - SERVER_PRINCIPAL_IMPERSONATION_GROUP
 - SERVER_ROLE_MEMBER_CHANGE_GROUP
 - SERVER_STATE_CHANGE_GROUP
 - TRACE_CHANGE_GROUP
 - <https://www.ultimatewindowssecurity.com/sqlserver/auditpolicy/auditactiongroups/default.aspx>
- Audit for public role

Database level operations

- Database level action groups to audit
 - DATABASE_OBJECT_CHANGE_GROUP
 - DATABASE_OBJECT_OWNERSHIP_CHANGE_GROUP
 - DATABASE_OBJECT_PERMISSION_CHANGE_GROUP
 - DATABASE_OPERATION_GROUP
 - DATABASE_OWNERSHIP_CHANGE_GROUP
 - DATABASE_PERMISSION_CHANGE_GROUP
 - DATABASE_PRINCIPAL_CHANGE_GROUP
 - DATABASE_PRINCIPAL_IMPERSONATION_GROUP
 - DATABASE_ROLE_MEMBER_CHANGE_GROUP
 - SCHEMA_OBJECT_CHANGE_GROUP
 - SCHEMA_OBJECT_OWNERSHIP_CHANGE_GROUP
 - SCHEMA_OBJECT_PERMISSION_CHANGE_GROUP
 - <https://www.ultimatewindowssecurity.com/sqlserver/auditpolicy/auditactiongroups/default.aspx>
- Audit for public role

Audit other significant actions performed by known admins

- Direct queries or updates to important tables
- Select, update, delete on important tables by privileged user
- Execution of stored procedures
- Understand
 - Application authority model and architecture
 - Which tables are important
 - Confidentiality
 - Integrity
- How



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SQL Server

Privileged user activity

Next step

Your SIEM

logpoint solarwinds LogRhythm
EventTracker GFI McAfee
IBM RSA
ArcSight splunk

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SQL Audit

- Output – 2 different formats available
 - Windows event log
 - binary file format readable through a stored procedure

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SQL Audit

- Event log obvious choice?
- 5 reasons why you shouldn't use the event log
 - Performance
 - Security
 - Stability
 - Hard to understand
 - DB admin push back

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SQL Audit

- Binary audit log
 - Output to any folder on network
 - SIEM connector can then read it with zero-touch to production DB server
 - Hands off!
 - Fast, fast, fast
 - Binary file I/O is the fastest there is
 - No context changes flipping in and out of Windows API
 - Both directions





SQL Audit

- But how do you get the binary audit log into your SIEM?
 - LOGbinder SQL

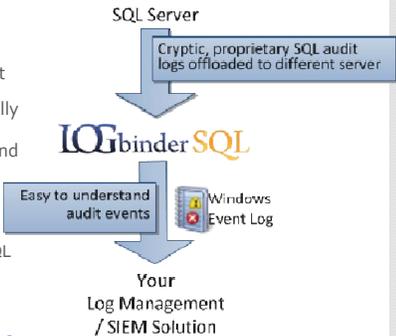






LOGbinder

- Small efficient Windows service that runs on any Windows server on your network
- One instance of LOGbinder SQL can process logs from many SQL Servers
- LOGbinder SQL can coexist with other LOGbinder products like LOGbinder EX for Exchange and LOGbinder SP for SharePoint
- Simply configure each SQL Server (optionally with our free [SQL Server Audit Wizard](#)) to write its audit events to a specified folder and then provide those folders to LOGbinder SQL.
- LOGbinder SQL
 - 1. Processes events as they appear in SQL Server binary audit log files
 - 2. Translates them into easy-to-read events
 - <http://www.logbinder.com/Products/LOGbinderSql/EventsGenerated>
 - 3. Forwards to your SIEM solution in its native format
 - ArcSight, Oradar, McAfee, EventTracker, LogRhythm, LogPoint, SolarWinds, Splunk and many, many more






LOGbinder

- Benefits
 - Application security intelligence for SQL Server
 - Fill the audit gap in your compliance efforts
 - Catch APTs that have penetrated upstream defenses
 - Less push back from database admins
 - Zero Impact
 - Use SQL Server's fastest, most efficient audit log output method and thereby offload all subsequent log processing from busy database servers to a server of your choice.
 - No agent required. LOGbinder SQL does not require an agent to be installed on your SQL Servers. In fact, LOGbinder SQL doesn't even need to send a single packet to your database servers.
 - Know what's happening inside of SQL Server including
 - Security operations involving logins, roles and permissions
 - Maintenance of tables, stored procedures and any other object
 - Database operations like backup and restore
 - Transact SQL table commands like insert, delete, update and select
 - Correlate SQL Server security activity with related events from the rest of your environment
 - No data silos or additional consoles to monitor




Bottom line

- SQL Server is where your data is
 - Not monitoring it with your SIEM is risky and non-compliant
- LOGbinder bridges the gap between SQL Server and your SIEM
- Now your SIEM can detect database intrusions within seconds
 - Without impacting your DB
- Download a free trial at
 - www.logbinder.com
- Free whitepaper
 - **Comparison: SQL Server Audit and SQL Trace**
 - <http://1drv.ms/1w96eNw>