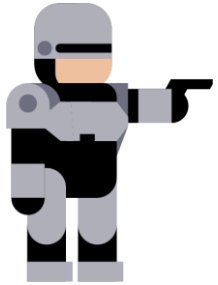
Limiting permissions in Dynamic SQL with Execute As

Russ Loski

About me

- SQL Server developer 20+ years
- Focus on ETL
- Husband, father and grandfather



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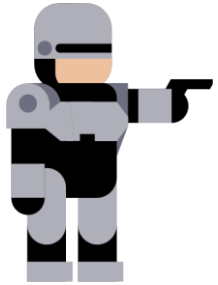
Agenda

- Security in depth
- Admin versus limited permission
- Execute As
- Limitations



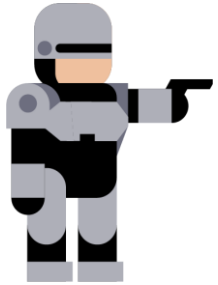
Security in Depth

"There's no silver bullet solution with cyber security, a layered defense is the only viable defense."

James Scott

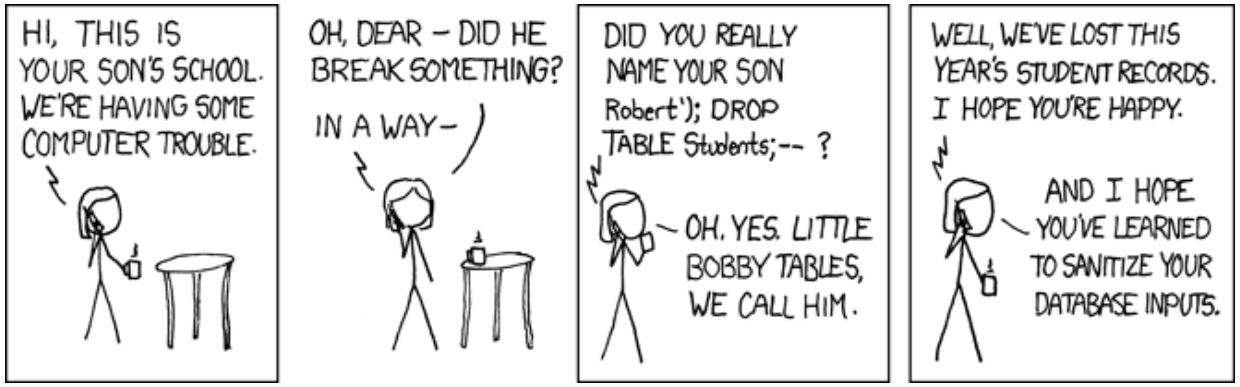
Dynamic SQL use cases

- Admin tasks over multiple databases, tables
- Managing users
- Validation scripts
- Data load scripts in Azure data factory

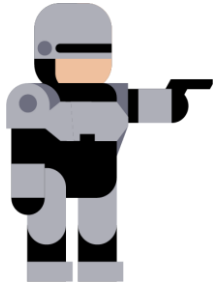


Dangers of dynamic SQL

- SQL Injection
- Drop objects
- View protected data
- Alter data
- Add logins or users to high privilege role

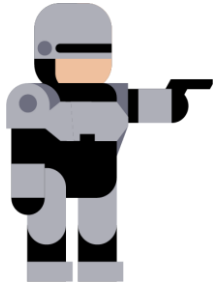


https://xkcd.com/327



Low permission calling user

- Session login should have just enough permission
- Session login should never be sysadmin or db_owner



Demo

Goals

- Only read one table
- No inserts deletes
- No drop object
- No create login

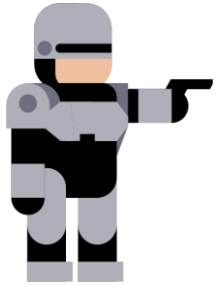
CREATE PROC WITH Execute As

Create Procedure

@param int

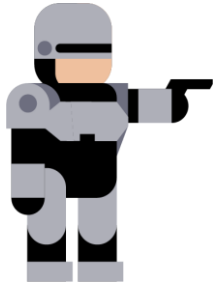
With EXECUTE AS 'username'

AS



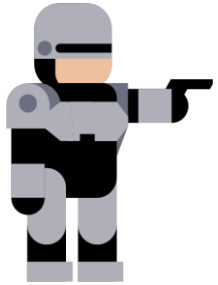
Limitations

- Only user not login
- No server level permissions
- No cross database



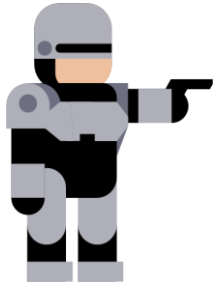
Caveat: Use other protections

- Don’t ignore other practices
  - Scrubbing
  - QUOTENAME()



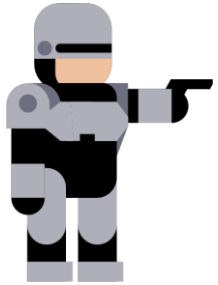
Summary

- Use caller with just enough permission
- Use “Execute As” in creating stored procedure
- Use other techniques to limit your dynamic SQL



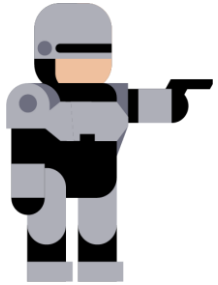
Resources: Castles

- Defence in Depth: The medieval castle approach to internet security – MedStack
- The Medieval Castle’s Best Defense Features & Mechanisms | by Sabana Grande | Lessons from History | Medium



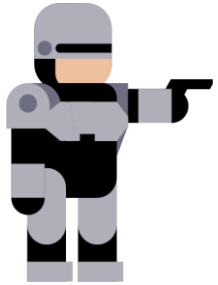
Resources: Execute As

- EXECUTE AS (Transact-SQL) - SQL Server | Microsoft Docs
- CREATE PROCEDURE (Transact-SQL) - SQL Server | Microsoft Docs



Resources: SQL Injection

- SQL injection cheat sheet: 8 best practices to prevent SQL injection | Snyk
- SQL Injection: Detection and prevention (sqlshack.com)
- SQL Injection - SQL Server | Microsoft Docs
- Limiting permissions with “Execute as” when using dynamic SQL | Loski's SQL Movements (sqlmovers.com)



Questions

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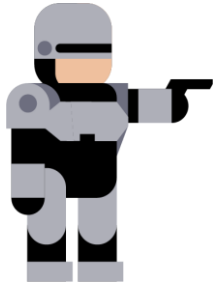

https://sqlb.it/?7109