

SQL Change Guard

System Architecture and Topology

Components, Data Flow and Deployment

On-premise | SQL Server | PostgreSQL | Oracle

1. Component Architecture

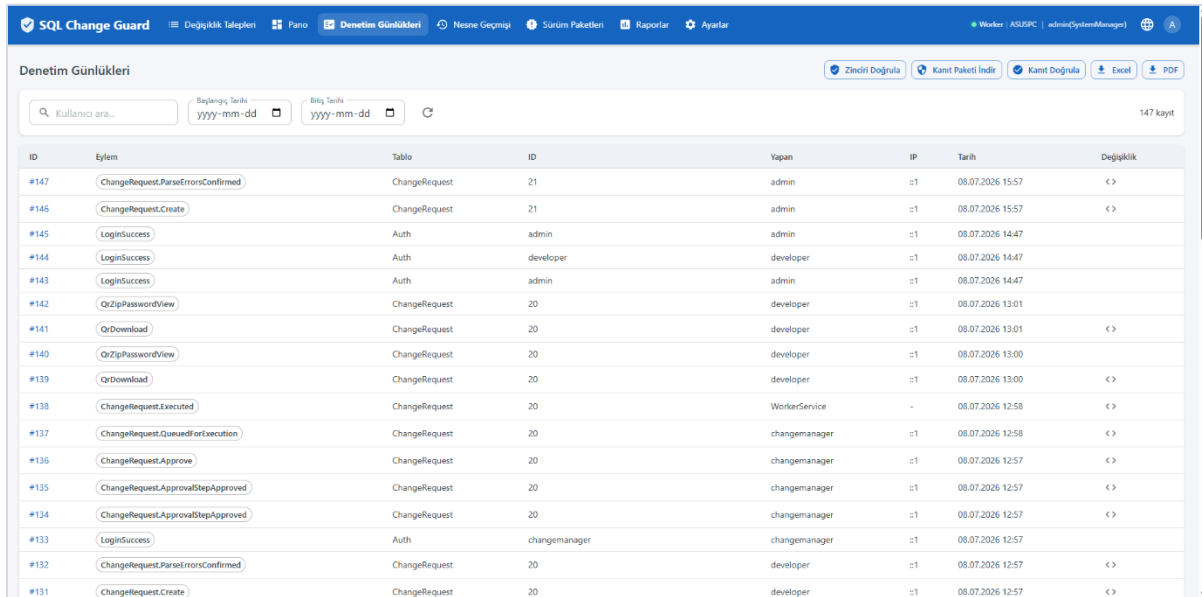
SQL Change Guard consists of three main runtime components; all run inside the corporate network.

- Web Interface (React): presentation layer where users manage change and query requests
- REST API (.NET 10): the core holding business rules, authorization, parsing, risk scoring, policy engine and audit engine
- Worker (Windows Service, Quartz): scheduled deployment, auto-execution and release package processing

Business logic lives only on the backend. UI control alone is not accepted as security; all rules are re-validated on the API.

2. Data Layers

- Application database (SQL Server): requests, scripts, approvals, roles, parameters, policy definitions, reports
- Immutable audit database: tamper-evident audit events protected by a hash chain
- Target databases (SQL Server / PostgreSQL / Oracle): live systems where changes are applied and queries run



ID	Eylem	Tablo	ID	Yapan	IP	Tarih	Değişiklik
#147	ChangeRequest.ParseErrorsConfirmed	ChangeRequest	21	admin	±1	08.07.2026 15:57	<>
#146	ChangeRequest.Create	ChangeRequest	21	admin	±1	08.07.2026 15:57	<>
#145	LoginSuccess	Auth	admin	admin	±1	08.07.2026 14:47	
#144	LoginSuccess	Auth	developer	developer	±1	08.07.2026 14:47	
#143	LoginSuccess	Auth	admin	admin	±1	08.07.2026 14:47	
#142	QrZipPasswordView	ChangeRequest	20	developer	±1	08.07.2026 13:01	
#141	QrDownload	ChangeRequest	20	developer	±1	08.07.2026 13:01	<>
#140	QrZipPasswordView	ChangeRequest	20	developer	±1	08.07.2026 13:00	
#139	QrDownload	ChangeRequest	20	developer	±1	08.07.2026 13:00	<>
#138	ChangeRequest.Executed	ChangeRequest	20	WorkerService	-	08.07.2026 12:58	<>
#137	ChangeRequest.QueuedForExecution	ChangeRequest	20	changemanager	±1	08.07.2026 12:58	<>
#136	ChangeRequest.Approve	ChangeRequest	20	changemanager	±1	08.07.2026 12:57	<>
#135	ChangeRequest.ApprovalStepApproved	ChangeRequest	20	changemanager	±1	08.07.2026 12:57	<>
#134	ChangeRequest.ApprovalStepApproved	ChangeRequest	20	changemanager	±1	08.07.2026 12:57	<>
#133	LoginSuccess	Auth	changemanager	changemanager	±1	08.07.2026 12:57	
#132	ChangeRequest.ParseErrorsConfirmed	ChangeRequest	20	developer	±1	08.07.2026 12:57	<>
#131	ChangeRequest.Create	ChangeRequest	20	developer	±1	08.07.2026 12:57	<>

Audit Logs - immutable audit records

3. Logical Flow (Change)

1. User creates a change request (script) from the web interface

- 2. API parses the script, validates with 84+ rules and produces a 0-100 risk score
- 3. Policy engine determines approval steps by server/environment/type
- 4. Authorized approvers approve by role
- 5. Optional: pre-validate with run and roll back in the sandbox
- 6. Worker or user executes the approved change on the target database in a single transaction
- 7. Result and all steps are written to the immutable audit

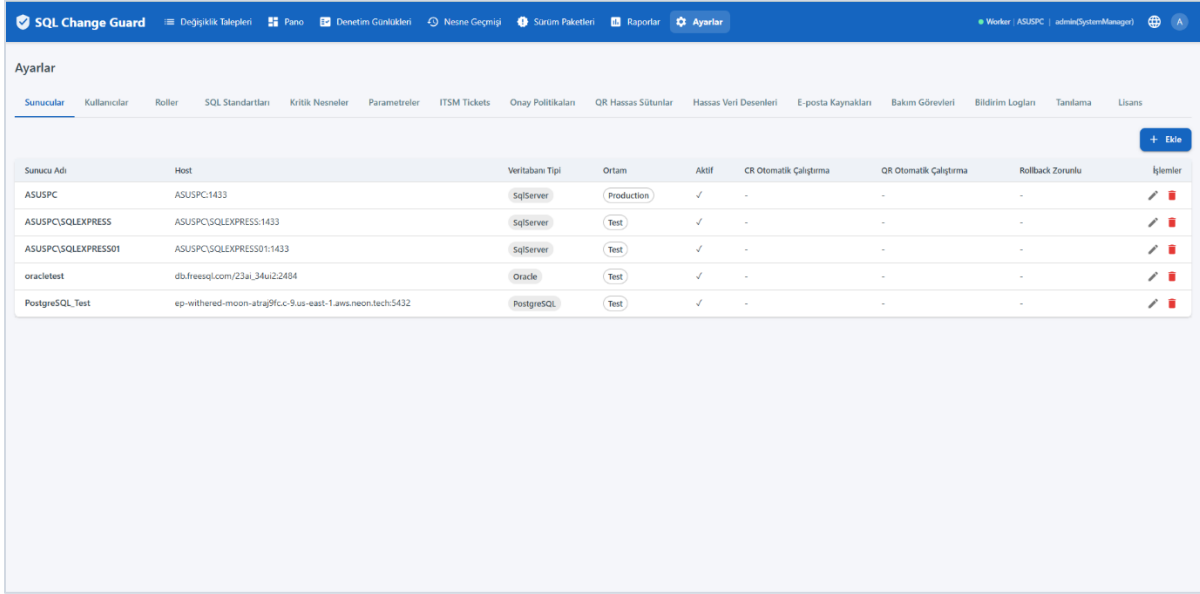
4. Logical Flow (Production Query)

- 1. User creates a production query (SELECT) request
- 2. Policy engine decides approval and masking based on critical table/sensitive column
- 3. Required approvals are obtained (DB Admin, security, extra approval for unmasked data)
- 4. The query runs; sensitive columns are masked
- 5. The result is delivered as an encrypted ZIP; download reason and record are kept
- 6. The whole process is written to the audit and QR masking log

5. Network Topology

All components sit within the corporate network; no internet connection is required.

- Clients to Web/API (HTTPS)
- API to application SQL Server (management data)
- API to immutable audit database (audit)
- API / Worker to target databases (SQL Server, PostgreSQL, Oracle)
- API to LDAP/AD (identity) and SMTP (notification)



Sunucu Adı	Host	Veritabanı Tipi	Ortam	Aktif	CR Otomatik Çalıştırma	OR Otomatik Çalıştırma	Rollback Zorunlu	İşlemler
ASUSPC	ASUSPC1433	SqlServer	Production	✓	-	-	-	✎ ✖
ASUSPC\SQLEXPRESS	ASUSPC\SQLEXPRESS1433	SqlServer	Test	✓	-	-	-	✎ ✖
ASUSPC\SQLEXPRESS01	ASUSPC\SQLEXPRESS011433	SqlServer	Test	✓	-	-	-	✎ ✖
oracletest	db.freessql.com/23ai_34u2-2404	Oracle	Test	✓	-	-	-	✎ ✖
PostgreSQL_Test	ep-withered-moon-atr9ffc-9-us-east-1.aws.neon.tech/5432	PostgreSQL	Test	✓	-	-	-	✎ ✖

Server Management - multiple SQL Server / PostgreSQL / Oracle in one place

6. High Availability and Recovery

- Single-transaction executor: all steps of a request under one transaction; rolled back on failure (SS/PG)
- Oracle atomicity: because DDL implicit-commits, Oracle changes containing implicit-commit statements require a rollback, which can be prepared automatically
- Immutable audit: records are integrity-protected by a hash chain
- Application and immutable databases can be protected with standard backup/replication

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