

SQL SERVER 2022

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It's the most Azure-enabled release with improvements across performance, security, availability. It is part of MSFT Intelligent Data Platform, unifying database, analytics & governance.

HOW TO USE THIS FIELD MAP?

If new to Azure SQL, you can start with [Foundations](#), then check [References](#), and finally step through [WAF Pillars](#). Alternatively, feel free to jump through [What's New](#) or specific WAF [pillars](#).

FOUNDATIONS

[Pages and Extents](#)
[Index Architecture](#)
[Memory Management](#)
[Query Processing](#)
[Thread Architecture](#)
[Transaction Log](#)
[Transaction Locking](#)
[Execution Plans](#)
[Statistics](#)
[Query Profile](#)

[System DB](#), [Contained DB](#), [Files & FGs](#)
[Collation](#), [Remote Storage](#) (Stream, Table, BLOB),
[Full Text Search](#), [Service Broker](#)
[MDS](#), [DQS](#), [Spatial](#), [Graph](#), [XML](#), [JSON](#), [CLR](#),
[Language Extension](#)
[Tables](#), [Views](#), [Indexes](#), [Sequence](#), [Triggers](#),
[Procedures](#), [Functions](#), [Track Changes](#)

[SQL Server on Linux](#), [Container \(Linux\)](#)
[Big Data Cluster](#)
[Migration Tools](#): [DB Experiment Assistant](#), [DB Migration Assistant](#), [SQL Migration Assistant](#), [Azure Migrate](#)

WHAT'S NEW

[Synapse Link](#)
[S3 Integration](#)
[Data Virtualization](#)
[SQL ML Link](#)
[Contained AG](#), [Distributed AG](#)
[Defender](#), [Purview](#), [AAD](#), [Arc](#) Integration
[Encrypt with TDS 8.0](#)
[Intelligent Query Processing](#)
[Query Store](#): [Hints](#), [Forced Plans](#), [Secondary Replica](#)
[ML Service for Python, R](#)
[Database Ledger](#)

REFERENCES

It's impossible to cover all reference out there, let's focus on...

Skilling: [SQL Server Sessions on Data Exposed](#),
[Microsoft SQL Server Blog](#), [Microsoft Tech Community Channel](#), [Mechanics Channel for SQL 2022 Labs](#):
[SQL for App Dev](#), [ML on SQL Server](#).

MSFT Offering: [SQL Server 2022 Preview Download](#), [Microsoft Intelligent Data Platform](#), [Early Adoption Program for SQL 2022](#), [SQL Server End of Support \(2012 or less\)](#), [SQL Server Migration Enablement](#), [MSFT Partner Resources for SQL Server](#)

SECURITY

Security is the most critical WAF pillar. Let's get to it and categorize Security measures as Identity Management, Access Management, Surface Management, Protect Data and finally, Monitor/Audit.

[Authentication Modes](#). Roles: [Server](#), [Database](#), [App Principal](#), [Credentials](#), [Securables](#), [Permission](#), [Permission Hierarchy](#)
[Encryption](#), [Encryption Hierarchy](#). [Transparent Data Encryption \(TDE\)](#)

[Always Encrypted](#), [Secure Enclaves](#), [Encrypt Connection with TDS 8.0](#)
[Extensible Key Management \(EKM\)](#), [EKM with Azure Key Vault \(AKV\)](#)
[Row Level Security](#), [Dynamic Data Masking](#), [SQL Server Audit](#)

COST OPTIMIZATION

After Security, generally Cost holds the next priority for clients. Though it's very difficult to talk about this pillar in isolation. Firstly, every Org needs to establish a baseline Consumption (capacity, cost) Forecast, Budget & Ownership and then be able to Track and Report consumption. And then, we need to approach Architecture as such to elevate Demand Management (e.g., throttle) and Supply Management (e.g., scale).

[Software Assurance to save on SQL Licenses](#)

Review Features by Edition to reduce costs ([SQL2019](#))

(Azure) SQL VM on [Windows](#), [Linux](#), [Dedicated Host](#), [SQL IaaS VM Extension](#)

[Shift Capex to Opex](#) (Azure Migration):

- [Right Sizing](#), [Azure Hybrid](#)
- [Reserved Instance](#), [HADR on Azure](#)
- [SQL Server Standard VM Scale Sets](#)
- [Azure SQL Serverless](#)

[Azure Advisor \(Cost Pillar\)](#), [Azure Cost Management](#)

OPS EXCELLENCE

Ops Excellence proves the real-world agility and maturity of a business in managing Business Systems. At its core, Ops Excellence is all about how SDLC is managed, underscoring practices around Development, Deployment and Operation with Security, Monitoring and Automation embedded every step of the way.

[Database Lifecycle Management](#)

[Policy Based Server Management](#)

[Data Compression](#): [Row](#), [Page](#), [Unicode](#). [Resource Governor](#)

[Maintenance Plans](#), [SQL Assessment API](#), [SQL Server PowerShell](#)

[CD with Azure DevOps \(lab\)](#). [DACPAC \(lab\)](#). [ARM Templates](#). [SSDT](#). [Retry Logic](#)

RESILIENT

Business should take lead on this and define must-have or preferred Availability and Recovery Metrics (SLA, MTTR, MTBF etc). This should inform Architecture – outlining High Availability (scale, prevent failure), Disaster Recovery (recognize failure, and recover) and Monitoring (service uptime, [chaos engineering](#), testing).

Know your [Target SLA](#) and [Achieved SLA](#)

[Always on Availability Group](#) [[setup](#)] [[reference](#)]

[Always on Failover Cluster](#) [[setup](#)] [[reference](#)]

[Database Mirroring](#), [Log Shipping](#), [Replication](#): [Transactional](#), [Merge](#)

[Stretch Database](#). [Backup Restore](#), [Accelerated Recovery](#)

PERFORMANCE EFFICIENCY

Performance is an interesting pillar – for it can be negatively impacted by almost all other pillars, but positive impact must be weaved in! Low-cost commitment or subpar operations or security measures can limit it. For this, establish Monitoring (workload, resources, baseline), Design for Performance, and Remediate Contention.

Monitoring. Most critical input in performance tuning is Baseline – workload & consumption. Workload expectation is business driven, and Consumption Baseline should be established via monitoring (and adjusted) over a period.

[Configure Server for Performance](#)

- Data & Log Files, Temp DB, Server / DB Config

[Options for Query Performance](#)

- Index, Partition, Parallelization, Statistics

Tune SQL Server for [IO](#), [Memory](#), [CPU](#)

[Database Tuning Advisor](#), [Query Tuning Assistant](#). [Automatic Tuning](#), [Query Store](#)