

SQL Server 2025's General Availability Announcement:

Reference: <https://techcommunity.microsoft.com/blog/sqlserver/sql-server-2025-is-now-generally-available/4470570>

Overview

- SQL Server 2025 is now generally available (announced Nov 18 2025).
- This release continues Microsoft’s “one consistent SQL” promise — meaning a consistent engine/platform across on-premises, cloud, and SaaS.
- Emphasis is on being an AI-ready enterprise database built on top of SQL Server’s foundations of security, performance, and availability.
- The product has already seen broad participation: ~10,000 organizations in the public preview and ~100,000 active SQL Server 2025 databases.

Key innovations / major new features

1. AI built-in

- AI features are integrated directly into the engine: semantic search, natural language experiences across enterprise data.
- Model management built into T-SQL: supports Microsoft Foundry, Azure OpenAI Service, OpenAI, Ollama and more.
- Support for vector embedding, text chunking, DiskANN indexing—enabling AI-powered apps using familiar T-SQL.
- Integration with frameworks like LangChain and Semantic Kernel to speed dev of AI-powered applications.

2. Made for developers

- Enhancements: Native JSON support, REST APIs, RegEx, fuzzy string matching.
- Change event streaming (captures change-data to Azure Event Hubs) for real-time, event-driven apps with lower overhead compared to CDC.
- Tooling improvements:
 - SQL Server Management Studio (SSMS 22) now generally available, with ARM64 support and AI-assistance via GitHub Copilot workload.
 - The Microsoft Python Driver for SQL Server (mssql-python) is now generally available, with Entra ID authentication.

3. Security, performance, availability

- Builds upon SQL Server’s reputation for security (noted as “most secure database in the last decade”).
- Modern identity/encryption: Microsoft Entra managed identities for credential management.
- Performance improvements: optimized locking (reduces lock memory consumption, less blocking, higher concurrency).

- Tempdb space resource governance to improve reliability.
- Optional parameter plan optimization (OPPO) to lessen parameter-sniffing issues.
- Availability groups enhancements: faster failover, improved diagnostics, hybrid flexibility.
- Preliminary benchmarks: On AMD EPYC + HPE hardware, SQL Server 2025 shows new record performance and ~4% better price-performance in the 3 TB category compared to previous results.

4. Cloud and hybrid enhancements

- Support for database mirroring into Microsoft Fabric (near real-time analytics without ETL).
- Azure Arc integration for unified management, security, governance across on-premises, cloud.
- On Linux:
 - New support for RHEL 10 and Ubuntu 24.04.
 - TLS 1.3 support, custom password policies, signed container images.
 - Performance improvements: tmpfs support for tempdb, container-based deployments, generic ODBC data sources via PolyBase.
- On Azure VMs: All editions of SQL Server 2025 (Standard, Enterprise, Enterprise Developer, new Standard Developer edition) supported; optimized VM families; Premium SSD v2 / Ultra Disk storage options.

5. Product changes / editions

- Standard edition: increased resource limits — up to 32 cores and 256 GB memory. Resource Governor now available in Standard edition.
- Introduction of a new *Standard Developer* edition: full feature parity with Standard edition, designed for development/testing.
- Express edition: maximum database size increased to **50 GB** per database. Express Advanced mode consolidated into a single Express edition with all former abilities.
- Discontinuation of Web edition: SQL Server 2022 is the final version with Web edition; supported until January 2033 under Microsoft's fixed lifecycle policy.
- As part of reporting/analytics changes: On-premises reporting solution moves toward integration with Power BI Report Server (unifying paginated + interactive reports for paid licences).

Why this matters for you:

- As someone interested in SQL Server replication, clustering, AlwaysOn, log shipping etc., this release introduces enhancements to availability and performance (e.g., availability groups faster failover).
- Since you're interested in patching and DB admin tasks: new editions, enhanced tooling (SSMS 22, Python driver), and cloud/hybrid support will affect upgrade/patch planning, especially moving workloads to cloud or hybrid.

- For developers and administrators, the AI built-in features and developer productivity enhancements (JSON, REST APIs, RegEx, fuzzy match) open new opportunities for modernising database apps.
- If you are using Linux, containers, hybrid environments, the enhancements in SQL Server 2025 for Linux and Azure VMs make it more viable for those non-Windows deployments.
- The increased resource limits in Standard edition (and Express's 50 GB DB size) may affect your environment architecture choice and licensing decisions.

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Detailed breakdown of new and changed features in SQL Server 2025 (17.x) that are especially relevant for you as a DBA working with replication, log shipping, availability/failover (Always On), patching/upgrade planning, hybrid environments, and administration. Annotated **what's new or changed**, **implications**, and **what to test/prepare**.

Availability / High Availability / Disaster Recovery

These are key given your interest in clustering, Always On, log shipping etc.

What's new / improved

- The official “What’s New” doc identifies *Availability* as one of the feature-highlight areas. [Microsoft Learn](#)
- Improved support for availability groups (AGs) — more secondaries, better failover options, enhanced diagnostics & routing. For example: “Always On Availability Groups now support more secondary replicas and faster failovers, delivering better resilience for mission-critical workloads.” [Nova DBA+1](#)
- Backups on secondary replicas have improved (in some reports full/differential backups can now be done on any secondary, not just copy-only) and new compression (Zstandard) supported. [Hynellis+1](#)
- Enhanced failover behaviour: e.g., asynchronous page request dispatch by default / faster recovery / new health-check options. [Hynellis+1](#)
- For hybrid/cloud connectivity: Better integration with Azure Arc and hybrid management. [SQLServerCentral+1](#)
- Edition changes matter (for HA licensing/planning): The Standard edition now supports up to 32 cores & 256 GB RAM. [Brent Ozar Unlimited®+1](#)

Breaking / changed behaviour to watch

- The “Breaking changes” doc specifically flags AG/HA features: e.g., changes to encryption and connectivity for linked servers/AGs and others. [Microsoft Learn](#)
- For log shipping: Remote log-shipping monitoring can break if a remote monitor is a SQL Server 2025 instance and other instances are older. [Microsoft Learn](#)
- For replication: If you have a remote distributor, replication components might fail unless you configure trusted certificates. [Microsoft Learn](#)
- Some deprecated features: For example, database mirroring is deprecated (and replaced by AGs / Fabric mirroring). [Microsoft Learn+1](#)

Implications & what to prepare/test

- **Failover testing:** Set up a test AG on SQL 2025 and verify failover behaviour under load, test the health-check options, investigate how asynchronous page request dispatch works in your hardware environment.
- **Secondary backups:** If you plan to offload backups to a secondary, test backup/differential/full on those secondaries to ensure it works as expected.
- **Hybrid scenarios:** If you use on-prem + cloud or Azure Arc, test connectivity, monitoring/integration with Azure Portal.

- **Licensing/edition planning:** Because Standard edition now has higher limits, you may review whether you can use Standard instead of Enterprise (depending on your HA/DR requirements).
- **Breaking change mitigation:** For log shipping / replication / linked servers ensure certificates/trust settings are in place. Specifically verify that remote monitor or distributor topologies won't break after upgrade.
- **Deprecation planning:** If you're still using database mirroring or other deprecated features, plan to migrate off them (e.g., move to AGs).
- **Monitoring & diagnostics:** Update your monitoring tools/scripts to support the new features and ensure you can read the new health and routing diagnostics.

Replication & Log Shipping

Given your interest in replication and log shipping, these deserve special focus.

Replication

- The breaking changes doc states: "Replication components might fail after upgrade if publisher is SQL Server 2025, distributor is remote, and isn't configured with trusted certificate." [Microsoft Learn](#)
- The general "What's New" doc doesn't list many *positive* new replication features — the emphasis is more on availability, performance, AI etc. [Microsoft Learn](#)
- So for replication your focus is primarily on the upgrade/compatibility and encryption/trust configuration.

Log Shipping

- The breaking changes doc includes: "Remote log shipping monitoring can break if the monitor is a remote SQL Server 2025 instance when other instances in the topology use a previous version." [Microsoft Learn](#)
- Again, fewer headline *new features* for log shipping, but this means the upgrade path and monitoring compatibility are the risk areas.

Implications & what to prepare/test

- For replication: In your test upgrade, replicate from a pre-2025 publisher/distributor to a 2025 subscriber (and reverse) and monitor for failures. Confirm that your linked servers/distributor configurations use trusted certificates or set `trust_distributor_certificate` as appropriate.
- For log shipping: If you use a monitor on a remote server, test that the monitoring database and alerting still function when one side is on 2025 and the other older.
- Verify that your replication and log shipping monitoring/alerting tools are supported/updated for SQL 2025.
- Consider whether you might migrate replication to a newer high-availability paradigm (for instance, AGs or change-event streaming) if appropriate.

Patching, Upgrade & Administration

Your interest in patching, DBATools, and installing is well aligned with new changes in this version.

What's new / improved

- The “What’s New” doc includes: edition changes, breaking changes, etc. [Microsoft Learn](#)
- Increase in Standard edition capacity: up to 32 cores and 256 GB memory. [Microsoft Learn+1](#)
- Breaking changes to connectivity: e.g., default encryption, new client provider (Microsoft.Data.SqlClient), TDS 8.0 default. [Hynellis+1](#)
- For Linux/deployment: New support for Red Hat 10, Ubuntu 24.04 etc. (mentioned in blog) though I don’t have a detailed item here.
- Improved performance/governance: e.g., tempdb resource governance, improved locking, etc. While not strictly “patching”, it affects admin workflows. [Hynellis+1](#)

Implications & what to prepare/test

- **Upgrade planning:** Build a test environment with SQL 2025 and run your DBATools scripts, patching workflows, monitoring, automation, etc, in it.
- **Client connectivity testing:** Update your clients, scripts, SSIS/PowerShell etc to use Microsoft.Data.SqlClient and ensure encryption/trust settings do not cause failures with legacy tooling.
- **Tempdb and resource governance:** If you run multi-tenant or heavy loads, test the new tempdb governance features to prevent runaway tempdb use.
- **Monitoring & tooling compatibility:** Ensure that your third-party/hand-rolled monitoring, backup/restore scripts, log shipping, replication monitoring all support SQL 2025.
- **Patching cadence:** Since this is a major version, consider how cumulative updates and service packs will roll out. Also review deprecated/removed features early (so your automation doesn’t attempt to call them).
- **Testing of hybrid/cloud integration:** If you use on-prem + Azure/hybrid, test connectivity/integration via Azure Arc, managed identities etc.

Hybrid / Cloud / Analytics

While your primary interest is DBA/HA/replication, the hybrid/cloud aspects also impact architectures.

What's new / improved

- Tighter integration with Microsoft Fabric: Databases can mirror into Fabric / OneLake for analytics. [SQLServerCentral+1](#)
- Azure Arc support for unified management of on-prem + cloud instances. [Microsoft Learn](#)
- On Linux and containers: improved support (new OS releases, TLS 1.3, signed images, tmpfs for tempdb) though this is more infrastructure than just DBA. [Microsoft Learn+1](#)

Implications & what to prepare/test

- If you have hybrid or cloud-linked workloads, test the end-to-end path (e.g., on-prem SQL 2025 → Mirror/Feed into Fabric/OneLake) and measure latency, security, data sovereignty.
- Check that your backup/DR strategy accounts for hybrid cloud movement and remote monitoring/integration.

- For container or Linux-based deployments, if you use them, test SQL 2025 on those platforms (and check any changes to tempdb and storage behaviour).
- Consider whether new features (e.g., mirroring to Fabric) might allow you to rethink your DR/analytics pipeline.

 **Summary Table: Key Areas & What You Need to Do**

Area	What's new/changed	What you should test / prepare
Availability / AGs	More secondaries, faster failovers, better diagnostics, backup on secondaries	Set up AG test bench, check failover speed, backup on secondaries, revise HA plan
Replication	Breaking changes around encryption/trust, remote distributors	Test replication topologies with SQL 2025, update certificates/trust settings
Log Shipping	Monitoring may break if mixed versions	Test log shipping & monitoring in mixed version environment, update monitoring tools
Patch & Upgrade	New edition limits, client provider change, stricter encryption defaults	Test upgrade path, update client libraries, validate scripts/automation
Hybrid/Cloud	Fabric integration, Azure Arc, container/Linux improvements	Test hybrid workloads, container/OS compatibility, cloud connectivity & security
Deprecation	Some features removed or deprecated (e.g., Web edition, MDS, DQS)	Inventory your usage of deprecated features and plan migration ahead of upgrade

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Complete SQL Server 2025 Pre-Upgrade Checklist (DBA-Focused)

Designed specifically for replication, AlwaysOn/AGs, log shipping, HA/DR, patching, automation, and hybrid cloud environments.

SQL Server 2025 Pre-Upgrade Checklist (DBA Master Version)

(A practical, field-ready checklist you can copy into your upgrade SOPs.)

1. Pre-Assessment & Inventory Phase

1.1 Inventory all SQL Server components

- SQL Server Engine versions, editions, CU levels
- SSRS / SSIS / SSAS
- Replication components (Publisher, Distributor, Subscriber)
- Log Shipping primary / secondary / monitor
- Availability Groups (synchronous/asynchronous replicas, read-routing)
- SQL Server Agent jobs
- Linked servers
- SQL client versions (ADO.NET, ODBC, JDBC, PowerShell modules)

1.2 Identify deprecated / removed features

SQL Server 2025 deprecates/removes:

- **Web Edition** (2022 last version)
- **Database Mirroring** (fully deprecated)
- **DQS / MDS** removal
- Report Server changes (Power BI Report Server shift)
- Legacy encryption settings & legacy TLS
- Older client libraries not supporting **TDS 8.0**

If your environment uses any of the above:

- Plan replacement/migration

2. HA/DR Upgrade Readiness

2.1 Availability Groups (AlwaysOn)

SQL 2025 introduces new AG internals, faster failovers, secondary backup flexibility.

Validate:

- Primary + secondary replicas version/edition compatibility
- If using **read-routing**, validate routing URLs (encryption defaults changed)
- Test failover under workload
- Validate seeding (encrypted transport changes)
- Validate Distributed AG topologies

Special to test:

- **Secondary backups** (verify differential + full allowed and consistent)
- **Synchronous commit + HADR_SYNC_COMMIT behavior** after upgrade

2.2 Log Shipping

SQL Server 2025 introduces breaking changes for remote monitors.

Check:

- Monitor server version compatibility
- Alerts (job failures, restore latency)
- Backup compression (especially ZStandard compression tests)
- Application failover runbook is still valid
- Log shipping cleanup job (new retention rules)

 **2.3 SQL Replication**

Breaking change: **remote distributor or mixed-version topology requires trusted certificates.**

Check:

- Are any Publishers < 2025?
- Is Distributor remote?
- Do all servers have matching **trust certificates** installed?
- Re-run: `sp_validatemergepublication / sp_replmonitorhelppublisher`
- Snapshot agent encryption test
- Validate Distribution Agent with `encryption=required`

3. Security, Connectivity & Certificates **3.1 Encryption upgrade readiness**

SQL 2025 changes default client/server encryption:

- TLS 1.2/1.3 supported everywhere
- Update old JDBC/ODBC/ADO.NET providers
- Update PowerShell SQL Providers
- Update connection strings that rely on `TrustServerCertificate=yes`

 **3.2 Linked Server Connectivity**

SQL 2025 enforces:

- stronger certificate checks
- new provider defaults

Checklist:

- Test every linked server connection
- Ensure all remote providers use Microsoft OLE DB Driver 19+
- Validate RPC OUT procedures
- Validate distributed transactions (MSDTC TLS enforcement)

4. Performance & Database Engine Readiness **4.1 Check new 2025 Engine behaviors**

SQL 2025 introduces:

- Optimized locking
- TempDB resource governance
- Optional Parameter Plan Optimization (OPPO)
- Default TDS 8.0 protocol

Checklist:

- Compare existing workload baseline
- Enable/disable OPPO per database depending on workload pattern
- Check TempDB file size & governance compatibility
- Validate memory clerk changes under your workload

- Measure latch waits, lock waits before/after upgrade

4.2 Pre-Upgrade Workload Testing

- Restore production copy into SQL 2025 test instance
- Run production workload replay (Distributed Replay / OSTRESS / HammerDB)
- Validate performance regressions
- Validate plan stability
- Capture Query Store baselines pre-upgrade

5. Application & Client Compatibility

5.1 Application testing

Test apps using:

- .NET, Java, PHP, Python, PowerShell
- SSIS packages
- Linked servers
- Vendors (SAP, Dynamics, Oracle gateways, etc.)

Checklist:

- Update drivers to latest versions supporting SQL 2025
- Test MARS, connection pooling, encryption
- Validate failover logic in client apps

5.2 SSRS / SSIS / SSAS

- SSIS packages using old providers must be updated
- SSRS moving toward Power BI Report Server
- SSAS Tabular compatibility mode validation

6. Backup, Restore & Maintenance

6.1 Backup testing

- Test FULL + DIFF + LOG backup chains
- Validate ZStandard compression performance
- Validate restore speed
- Validate CHECKDB performance changes
- Rebuild maintenance plans using 2025 new rules

6.2 Validate Monitoring Systems

- SCOM monitoring
- Idera / RedGate / SolarWinds / Quest Spotlight
- Custom alert scripts using legacy DMVs

7. Edition & Licensing Review

SQL Server 2025 introduces:

- Standard Edition: **32 cores + 256 GB RAM**
- Express Edition: **50 GB per database**
- Web Edition removed

Checklist:

- Recalculate licensing impact
- Evaluate if Enterprise edition can be replaced with Standard

- Update VM sizing
- Validate NUMA node distribution (important for 32-core Standard)

8. Automation, Jobs & Maintenance

8.1 SQL Agent Jobs

- Rerun/validate all jobs
- Confirm SSIS package version compatibility
- Check log shipping jobs post-upgrade
- Validate replication agent jobs

8.2 PowerShell / DBATools

- Update DBATools to latest
- Test Install-DbaInstance and Update-DbaInstance for SQL 2025
- Validate Kerberos/Managed Identity login flows
- Validate SMO compatibility with SQL 2025

9. Final Go-Live Preparation

9.1 Pre-Go-Live Runbook

- Final Change Document approved
- Step-by-step rollback plan
- Snapshot of configs (sp_configure, sys.configurations, AG configs)
- Script out logins, jobs, credentials, linked servers

9.2 Go-Live Validation

After upgrade:

- Validate AlwaysOn Dashboard
- Validate Log Shipping latency
- Validate Replication Monitor
- Validate DB integrity with DBCC CHECKDB
- Run application smoke tests
- Monitor waits, CPU, IO

10. Final Post-Upgrade Checklist

- Update compatibility level if required
- Update statistics
- Enable Query Store hints (if using)
- Reconfigure backup compression level
- Update monitoring dashboards
- Capture new performance baseline

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