**Detailed comparison showing the differences between SQL Server 2017, 2019, and 2022 — including key new features for each release.**

| Feature Area | SQL Server 2017 | SQL Server 2019 | SQL Server 2022 |
|---|---|---|---|
| Release Year | 2017 | 2019 | 2022 |
| Platform Support | First version to support **Linux** (Red Hat, Ubuntu, SUSE) and Docker. | Enhanced Linux support with PolyBase, replication, and Machine Learning Services. | Further Linux enhancements; integrated with Azure Arc for hybrid cloud management. |
| Big Data Integration | None (PolyBase limited to some connectors). | **Big Data Clusters** (HDFS, Spark, Kubernetes integration) for data virtualization & analytics. | Retired Big Data Clusters; focus shifted to **Azure Synapse Link** & external table improvements. |
| Intelligent Query Processing (IQP) | Basic adaptive query processing features (adaptive joins, interleaved execution). | Expanded IQP: table variable deferred compilation, batch mode on rowstore, approximate count distinct. | Further IQP improvements: degree of parallelism feedback, parameter sensitive plan optimization. |
| Security Enhancements | Always Encrypted (basic), Row-Level Security, Dynamic Data Masking. | Always Encrypted with secure enclaves for richer queries; data classification. | **Ledger for SQL** (blockchain-based tamper evidence), Azure AD-only authentication, TDS 1.3 encryption. |
| Performance Features | Adaptive Query Processing (AQE) initial release. | Memory-optimized tempdb metadata; persisted computed columns batch mode; Scalar UDF inlining. | Intelligent Query Processing v2; faster failover in AG; built-in query store for all databases. |
| High Availability (HA) | Basic Always On AG, distributed AG. | Kubernetes support for AG; hybrid failover to Azure VM. | **Contained Availability Groups**, improved failover, multi-write replicas, cloud DR integration. |
| Machine Learning | R & Python support via Machine Learning Services. | R, Python, Java language extensions. | R, Python, Java, and enhanced external languages with sandboxing. |
| PolyBase Enhancements | Query external data from Hadoop, Azure Blob Storage. | Query external data from Oracle, Teradata, MongoDB, ODBC sources. | Expanded connectors; improved pushdown predicates; tighter integration with Synapse. |
| Accelerated Database Recovery (ADR) | Not available. | Introduced for faster rollback and recovery. | Enhanced ADR efficiency with lower version store footprint. |
| TempDB Improvements | Memory-optimized tempdb metadata not available. | Introduced **Memory-Optimized TempDB Metadata** for concurrency improvements. | Further performance tuning for metadata-heavy workloads. |
| Backup & Restore | Basic backups with compression & encryption. | Backup to Azure Blob Storage enhancements. | Native S3 object storage support for backup/restore. |
| Developer Features | Graph database support, resumable online index rebuild. | Resumable online index create; online columnstore index build. | **Resumable Online Index Operations for more index types; Parameter Sensitive Plan Optimization.** |
| Monitoring & Troubleshooting | Query Store for performance history. | Query Store enhancements; lightweight query profiling. | **Query Store enabled by default**; integrated with read replicas. |
| Cloud Integration | Basic Azure VM and Azure SQL Database migration tools. | Integration with Azure Data Studio; hybrid backup/restore to Azure. | **Azure Synapse Link, Azure Purview integration, SQL Managed Instance link** for near real-time replication. |
| Licensing & Editions | Standard, Enterprise, Developer, Express. | Same editions. | Same editions + enhanced benefits for hybrid licensing. |