SAP HANA PLATFORM

Top Ten Questions for Choosing In-Memory Databases

Start Here
**Top Ten Questions for Choosing In-Memory Databases**

1. Are my applications accelerated without manual intervention and tuning?

2. Can I achieve predictable response times for ad hoc queries?

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10. Does my database vendor have an in-memory database designed specifically for both transactions and analytics?
Are my applications accelerated without manual intervention and tuning?

**Yes**

Because SAP HANA stores data in memory first.

- All data is in-memory
- No tuning necessary
- Only 1 copy of data

No configuration needed

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**No**

Because all data is on the disk by default.

- In-memory cache
- Row cache
- Column cache
- Multiple data copies

Identify data to accelerate
Configure system
Duplicate data

Manual configuration needed
Can I achieve predictable response times for ad hoc queries?

**SAP HANA Platform**

Yes

Because all hot data is automatically in memory.

No predictable response times

**Disk-Based Database with In-Memory Cache**

No

Because only pre-selected data is copied in-memory.

Predictable response times

Next
3 Can I get the full picture of my business in real time?

**SAP HANA Platform**

**Yes**

- Because all hot data is automatically in-memory.
- No limit to the granularity.
- Same copy of data for transactional and analytical applications.

**Full business picture is available in real time**

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**Disk-Based Database with In-Memory Cache**

**No**

- Because only pre-selected data is copied in-memory.
- Need database administrator (DBA) to identify and physically copy all needed data to the in-memory cache.

**No full picture – advanced knowledge of the drill-downs is needed**
Can I answer all my data discovery questions without adding more DBAs to do data tuning?

SAP HANA Platform

Yes

Because all hot data is automatically in-memory.

VS.

Disk-Based Database with In-Memory Cache

No

The database must be periodically reconfigured.

- In-memory cache
- Row cache
- Column cache

DBA manually selects data to copy into memory

System restart required if data exceeds allocated memory

More questions = More DBA time
Can my application provide analytics while updating the same copy of data in real time?

SAP HANA is a true in-memory database that performs both transactions and analytics.

Transactions and analytics performed on same copy of data in-memory

The in-memory cache is not a database, it is just a read-only cache.

Transactions are performed only on data on the disk
Am I able to run my business in real time, with all my data in-memory, ready for processing?

**SAP HANA Platform**

Yes

Because SAP HANA is designed to manage data in-memory.

Future-proof – designed to run business at the speed of memory

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**Disk-Based Database with In-Memory Cache**

No

Because the solution is designed to manage data on disk.

Business innovation is limited by the speed of the disk

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DRAM cost

In-memory cache
Row cache
Column cache
Do my SAP Applications run better and faster on an in-memory platform?

**SAP HANA Platform**

*Yes*

Because SAP applications are optimized to run on SAP HANA.

Business logic resides inside the database

**Disk-Based Database with In-Memory Cache**

*No*

SAP applications are not currently certified to run on in-memory cache solutions.

Performance needs to be tested on a case-by-case basis
Can I simplify my IT landscape with an in-memory solution?

SAP HANA Platform  
Yes

Because SAP HANA is an all inclusive platform.

- Eliminates aggregates and indexes
- Avoids data duplication for operational reporting
- Provides an integrated system for any data type and data processing
- Encompasses application server and advanced analytics

One copy of data for all requests

Disk-Based Database with In-Memory Cache  
No

Because it is only a database.

- Multiple copies of data needed for different requests

SAP HANA

In-memory cache
Row cache
Column cache

Additional copies of data needed

Next
Can I run transactions and analytics on the same system without adding more DRAM and CPU resources?

Because SAP HANA requires only one copy of data.

SAP HANA Platform  Yes

VS.

Disk-Based Database with In-Memory Cache  No

Because data is copied and stored multiple times for transactions and analytics.

Next
Does my database vendor have an in-memory database designed specifically for both transactions and analytics?

Because SAP HANA is an in-memory database proven for both transactions and analytics.

5,800+ customers and 1,800+ startups using it since 2010

SAP HANA Platform - Yes vs. Disk-Based Database with In-Memory Cache - No

No plans announced
Find Out More

Learn More About SAP HANA

Check out the hana.sap.com website which has valuable resources for fast-tracking your knowledge of SAP HANA® and a rich support section designed to help you get the highest quality answers quickly and easily from SAP experts

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Engage with community experts on the SAP Community program to accelerate the development of HANA powered solutions

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SAP is here to help. Contact your local SAP representative:

+1-877-727-1127 ext 11001
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Are my applications accelerated without manual intervention and tuning?

**No - Manual configuration needed**

Disk-based databases are architected to manage data on disk and use add-on in-memory caches to selectively accelerate access to portions of data. To accelerate applications, DBAs identify what data to accelerate and ensure it is duplicated in the appropriate in-memory cache. Additionally they maintain indexes and other data structures to ensure that performance of both transactional and analytical workloads is acceptable. The task is daunting since it is often challenging to predict what data needs acceleration and to ensure mixed workload performance, which leads to extensive testing and tuning.

**Yes**

Because SAP HANA stores data in memory first. All data is in-memory, no tuning necessary, and only 1 copy of data.

**No configuration needed**

Because all data is on the disk by default.

**Manual configuration needed**

Identify data to accelerate, configure system, duplicate data.
Are my applications accelerated without manual intervention and tuning?

YES - No configuration needed

With SAP HANA neither specialized caches nor multiple data copies are needed. SAP HANA is architected to manage data in-memory by default and uses a columnar store to seamlessly run both analytics and transactions. Additionally, it uses CPU caches to work on compressed data, leverages multi-core processors to scan columns in parallel and uses SIMD instructions to simultaneously process multiple data sets, delivering unmatched performance without indexes or materialized views. Applications are automatically accelerated because the data they need is readily available in real-time, without DBA intervention.
Can I achieve predictable response times for ad hoc queries?

Because all hot data is automatically in memory.

**SAP HANA Platform**

Yes

**Disk-Based Database**

No

Because only pre-selected data is copied in-memory.

**NO - No predictable response times**

Disk-based databases are architected to manage data on disk and use add-on in-memory caches to accelerate access to portions of data. Only queries that exclusively access cached data can return results in a predictable time. All other queries experience delays because access times depend on parameters such as where the data is placed on disk, which indexes are used, and the number of parallel processes accessing the disk. Ad-hoc queries will experience unpredictable response times when some or all of the data required is available only on disk.
Can I achieve predictable response times for ad hoc queries?

**YES - Predictable response times**

SAP HANA Platform maintains data in-memory by default, and all queries - planned and unplanned (ad-hoc) - have real-time access to the data they need and can return results in a predictable amount of time. It is possible to estimate response times using processors' scan speed, memory access time and size of data accessed by a query. SAP HANA also maintains one single copy of the data to be used for both analytical and transactional workloads, eliminating possible delays related to data synchronization and ensuring all queries are performed on fresh data.

**No predictable response times**

Because only pre-selected data is copied in-memory.
Can I get the full picture of my business in real time?

**SAP HANA Platform**

Yes

Because all hot data is automatically in-memory.

**Disk-Based Database with In-Memory Cache**

No

Because only pre-selected data is copied in-memory.

**NO - No full picture – advanced knowledge of the drill-downs is needed**

Users are limited in the granularity of their real-time data analysis since disk-based databases are architected to manage data on disk and use a combination of add-on in-memory caches, indexes, pre-aggregates and materialized views to accelerate performance. For better performance the DBA has to duplicate data on in-memory caches and create data structures for data on disk before users can perform drill-downs. Additionally, if the size of the in-memory cache cannot accommodate all the required data, the DBA has to resize the system and potentially restart it.

Full business picture is available in real time

No full picture – advanced knowledge of the drill-downs is needed

Next
Can I get the full picture of my business in real time?

**YES** - Full business picture is available in real time

Since SAP HANA Platform maintains data in-memory by default, data can be aggregated on-the-fly along any dimension, without requiring indexes, pre-aggregates or materialized views. As a result, SAP HANA can not only return aggregates in real time but also allow users to drill down to any level of detail to analyze data. With SAP HANA, users can analyze data at any level of granularity in a self-service manner and obtain results in real-time.

No full picture – advanced knowledge of the drill-downs is needed

Because all hot data is automatically in-memory.

Because only pre-selected data is copied in-memory.

Need database administrator (DBA) to identify and physically copy all needed data to the in-memory cache.
Can I answer all my data discovery questions without adding more DBAs to do data tuning?

NO - More questions = More DBA time

Disk-based databases are architected to manage data on disk and use add-on in-memory caches and other data structures to accelerate performance. Before users can analyze data along new dimensions, DBAs need to configure and tune the database to ensure acceptable response times. This might involve copying data to the in-memory cache, dropping or creating new indexes, or creating materialized views. Some of these actions might negatively affect the performance of other applications and thus require additional tuning. For example, the time required to update indexes can slow down transactional applications.

The database must be periodically reconfigured. Because all hot data is automatically in-memory.
Can I answer all my data discovery questions without adding more DBAs to do data tuning?

**SAP HANA Platform Yes vs. Disk-Based Database with In-Memory Cache No**

Because all hot data is automatically in-memory.

**YES - No additional DBA time needed**

SAP HANA Platform is architected to manage data in-memory by default. Applications are automatically accelerated because the data they need is readily available in-memory. Additionally, both planned and unplanned questions are answered in real-time and drill-downs along any dimension are possible without additional DBA intervention. No data copies, indexes, pre aggregates or materialized view are required to deliver real-time performance.

The database must be periodically reconfigured. DBAs manually select data to copy into memory. System restart required if data exceeds allocated memory.

More questions = More DBA time
Can my application provide analytics while updating the same copy of data in real time?

SAP HANA Platform

SAP HANA is a true in-memory database that performs both transactions and analytics.

No

Disk-Based Database with In-Memory Cache

The in-memory cache is not a database, it is just a read-only cache.

Transactions

Analytics

Transactions and analytics performed on same copy of data in-memory

Transactions are performed only on data on the disk

Disk-based databases with an in-memory cache typically process transactions (update, insert or delete operations) on disk and then update the data in the in-memory cache to ensure read consistency. Applications that perform both transactions and queries would have to wait for transactions to complete on disk before accessing the updated data in the cache. Since disk access is much slower than memory access these applications will experience delays.
Can my application provide analytics while updating the same copy of data in real time?

SAP HANA is a true in-memory database that performs both transactions and analytics.

Transactions and analytics performed on same data in-memory

SAP HANA Platform

Yes

VS.

No

The in-memory cache is not a database, it is just a read-only cache.

Transactions are performed only on data on the disk.

SAP HANA Platform is an ACID, persistent, in-memory, columnar database that accelerates both queries and transactions using one data copy, in-memory. SAP HANA column table’s temporary delta store makes it efficient to process high-speed transactions. With SAP HANA Platform, applications can execute transactional and analytical workloads in parallel while preserving data integrity and system performance.
Am I able to run my business in real time, with all my data in-memory, ready for processing?

Because SAP HANA is designed to manage data in-memory.

**SAP HANA Platform**

Yes - Business innovation is limited by the speed of the disk

NO - Business innovation is limited by the speed of the disk

Disk-based databases are architected to manage data on disk and use caches and other data structures to accelerate data access. In this way the disk latency can be mitigated but not eliminated because the core engine has been optimized to manage data that reside on disk and cannot function if the data is not maintained in it. While analytical workloads on cached data can be processed without accessing the disk, transactional workloads always require disk access.

Future-proof – designed to run business at the speed of memory

DRAM cost

Business innovation is limited by the speed of the disk

Disk-Based Database with In-Memory Cache

No
Am I able to run my business in real time, with all my data in-memory, ready for processing?

Because SAP HANA is designed to manage data in-memory.

YES - Future-proof – designed to run business at the speed of memory

SAP HANA in-memory Platform maintains one data copy for both transactional and analytical workloads. All data is in a compressed, columnar format to maximize access speed and the amount of data managed in-memory. Using the dynamic tiering capability, rarely accessed data can also be maintained on disk-based, columnar tables. Access to this data remains fast because it can be moved to memory for processing without being reorganized. In this way, SAP HANA can manage databases of any size without being limited by the amount of available memory in a system.

Future-proof – designed to run business at the speed of memory

Business innovation is limited by the speed of the disk
Do my SAP Applications run better and faster on an in-memory platform?

Because SAP applications are optimized to run on SAP HANA.

**NO - Performance needs to be tested on a case-by-case basis**

SAP Business Suite runs efficiently on the leading RDBMSs, however, it has not been specifically optimized for any given RDBMS. At present, SAP Business Suite is not certified to run on the different RDBMSs with in-memory caches and performance on these extensions needs to be verified on a case-by-case basis.

Business logic resides inside the database

Performance needs to be tested on a case-by-case basis

SAP applications are not currently certified to run on in-memory cache solutions.
Do my SAP Applications run better and faster on an in-memory platform?

Because SAP applications are optimized to run on SAP HANA.

YES - Business logic resides inside the database

SAP HANA platform enables data-related business logic to run inside the database and provides a wealth of advanced business function libraries, algorithms and services to correlate and analyze data efficiently. SAP HANA also provides easy to use modeling capabilities to automatically push application logic to the database. SAP Business Suite takes full advantage of these capabilities, delivering increased performance.

Performance needs to be tested on a case-by-case basis.

SAP applications are not currently certified to run on in-memory cache solutions.
Can I simplify my IT landscape with an in-memory solution?

**SAP HANA Platform**
- Yes
- Eliminates aggregates and indexes
- Provides an integrated system for any data type
- Encompasses application server and advanced analytics

**Disk-Based Database with In-Memory Cache**
- No
- Multiple copies of data needed for different requests
- Additional copies of data needed

Because SAP HANA is an all-inclusive platform.

Because it is only a database.

**NO - Multiple copies of data needed for different requests**

Since disk-based databases are designed to manage data on disk, in-memory caches are deployed to accelerate data access. This involves the introduction of an additional technology layer as well as the synchronization and maintenance of multiple copies of data. As a result, the consumption of system resources, the burden of system administration and the complexity of the IT infrastructure increases.

One copy of data for all requests

Multiple copies of data needed for different requests
Can I simplify my IT landscape with an in-memory solution?

SAP HANA Platform simplifies IT landscapes by taking advantage of in-memory computing and by delivering application, database and integration services in one platform. By taking advantage of in-memory computing, it can efficiently process transactions, streams, graphs and advanced analytics, such as predictive, spatial and text, on the same system and on one copy of the data. Additionally, by delivering application, database and integration services in one platform, it reduces data movements and staging among operational systems and between database and application server. This results in better performance, a simplified IT infrastructure and lower administration costs.

SAP HANA Platform

YES - One copy of data for all requests

Because SAP HANA is an all inclusive platform.

Disk-Based Database with In-Memory Cache

NO - Multiple copies of data needed for different requests

Because it is only a database.
Can I run transactions and analytics on the same system without adding more DRAM and CPU resources?

Because SAP HANA requires only one copy of data. SAP HANA Platform

NO - More DRAM and CPU resources needed if running transactions and analytics

To process transactional and analytical workloads on the same system, disk-based databases need to use specialized in-memory caches. To leverage this new technology layer the database not only has to create multiple data copies and keep them synchronized, but in addition must also route incoming requests to the appropriate data copies. This increases the amount of CPU and memory required and delays system response.

No additional DRAM/CPU needed

More DRAM and CPU resources needed if running transactions and analytics
Can I run transactions and analytics on the same system without adding more DRAM and CPU resources?

SAP HANA Platform: **Yes**

- Because SAP HANA requires only one copy of data.

**YES - Because SAP HANA requires only one copy of data.**

SAP HANA Platform is designed to take advantage of the latest hardware innovations. It utilizes SIMD instructions, advanced parallelization with multi-core processors and data compression to maximize CPU and RAM utilization. This allows for processing mixed workloads on the same system and on the same copy of data with the most efficient utilization of system resources.

No additional DRAM/CPU needed.

Disk-Based Database with In-Memory Cache: **No**

- Because data is copied and stored multiple times for transactions and analytics.

More DRAM and CPU resources needed if running transactions and analytics.

Next