Product Datasheet

Hazelcast IMDG

An open source, cloud-native, in-memory data grid for fast, distributed data storage and compute

hazelcast.com/imdg

Feature Summary

- **In-Memory Data Grid:** Fast, scalable, cloud-native (Kubernetes + containers), fault-tolerant, in-memory object and JSON store with parallel application execution and strong data consistency mode.
- **Programming languages:** Java, .NET, Node.js, C++, Go, Python, Scala.
- **Integrations:** Spring, Apache Tomcat, Apache Spark, Apache Kafka, and more; see the Hazelcast Hub for the up-to-date list.
- **SQL querying.** Query data using industry-standard SQL.
- **Management Center.** Administration UI for per-node statistics, JMX APIs, REST APIs. Limited to 3 nodes for the open source version.

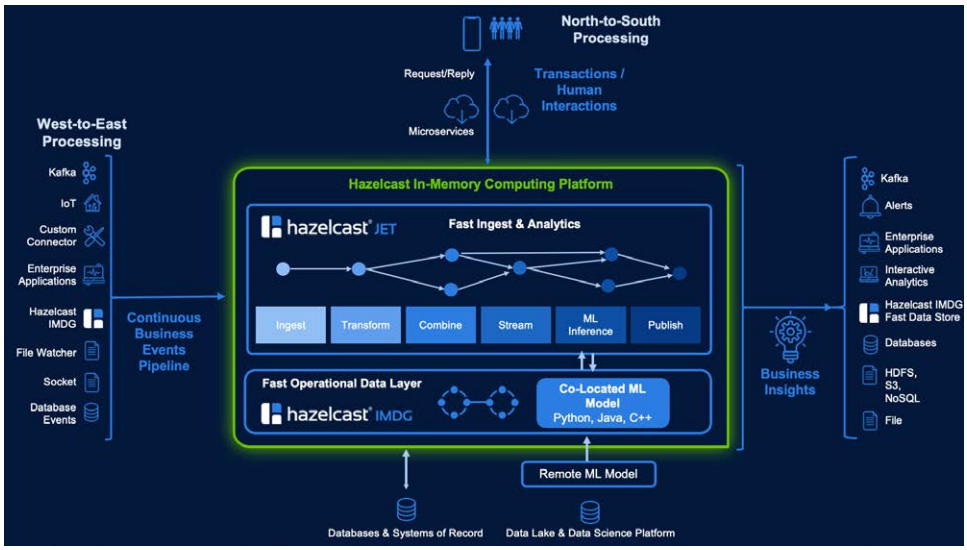
Hazelcast IMDG® is a cloud-native, distributed, in-memory computing platform that helps companies manage their data by using in-memory storage and performing parallel execution for breakthrough application speed and scale. IMDG is the leading open source in-memory data grid on the market with millions of deployed systems worldwide. IMDG is also available in commercial versions ("Enterprise" and "Pro") that add more enterprise-ready capabilities.

Why Hazelcast IMDG

Hazelcast IMDG is very fast and helps you build high-speed applications via two main capabilities:

Fast access to data. With its in-memory data object and JSON store, your applications can read and write data much faster than possible with disk-based databases. Writing to storage media is often a bottleneck in large-scale systems, and using the in-memory speed of IMDG will avoid that constraint and accelerate your overall application performance.

Parallel execution of application code. IMDG provides a framework for easily running code that is automatically distributed across all nodes in a cluster. Each instance performs work on the local in-memory data, thus tackling a large-scale data processing job in smaller parts while taking advantage of the collective power of all the CPUs.



Hazelcast IMDG is the fast operational data layer in the Hazelcast In-Memory Computing Platform.

IMDG is very easy to use, and you can get started by simply linking its compact library in your application. If you run multiple instances of your application

Feature Summary for Enterprise Version

- **Built-in security.** LDAP, Kerberos, x.509 certificates, role-based access controls, TLS/SSL, x.509, data-at-rest encryption.
- **WAN Replication.** Efficiently replicate data to a remote cluster.
- **Automatic Failover.** Clients automatically switch to the secondary cluster if the primary cluster is down.
- **High-Density Memory Store.** Allows the use of larger blocks of RAM by using off-heap memory. Support for Intel Optane as a cost-effective alternative to DRAM.
- **Hot Restart Store.** Stores in-memory data to disk which can be used to quickly repopulate IMDG.
- **Rolling Upgrades.** Allows upgrade of Hazelcast software in a cluster one node at a time without downtime.
- **Blue/Green Deployment Support.** Enables easy client switchover in a dual-cluster upgrade strategy.
- **PaaS Support.** OpenShift, VMware Tanzu (formerly Pivotal Cloud Foundry).

on different nodes in a network, each instance will broadcast to identify the other instances and will automatically form a cluster for you. You can also run IMDG in client-server mode and submit application code as a job, which will get distributed to all nodes and then run in parallel.

IMDG is also very reliable and supports high uptime. It replicates data across the cluster to safeguard against data loss should there be a hardware failure. It also provides WAN Replication (Enterprise version only) to efficiently copy data to a remote cluster for your disaster recovery strategy. IMDG is used to power some of the most demanding data processing environments in the world, where downtime means a significant amount of lost revenue.

Architecture

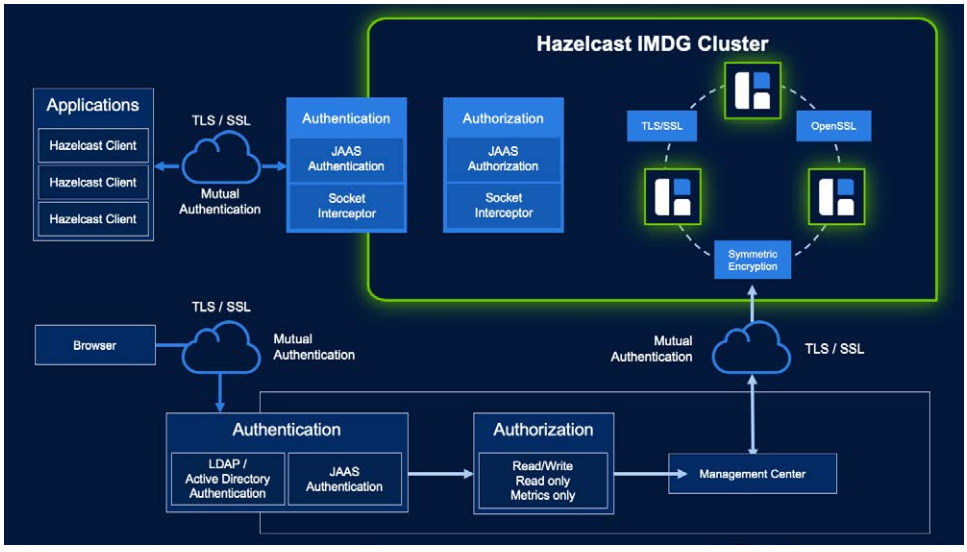
Hazelcast IMDG was built from the ground up as a cloud-native, in-memory data platform for environments that require high performance, scale, elasticity, and fault tolerance. It runs well in containerized environments orchestrated by Kubernetes. It supports an API familiar to many application developers to simplify the deployment of high-performance systems.

Performance at scale. Hazelcast® has run numerous benchmarks over the years to ensure the performance that customers need, as well as to demonstrate superior speed over comparable technologies. Published benchmarks are available here.

SQL support. Use industry-standard SQL to query in-memory data stored in IMDG for high-speed analytics. Leverage indexes to rapidly query on attributes in addition to keys.

Intel Optane support (Enterprise version only). Hazelcast takes advantage of Optane PMem as a high-scale, cost-effective alternative to DRAM, as well as a fast non-volatile store for persistent data to enable fast restarts.

Built-in security (Enterprise version only). IMDG offers a comprehensive security framework that includes support for Java Authentication and Authorization Service (JAAS), pluggable authentication (including LDAP and Kerberos out-of-the-box), role-based access controls, encryption of data-in-motion via TLS/SSL with minimal performance impact, x.509 certificates for client identity or mutual authentication, encryption for **Hot Restart** data-at-rest; key rotation, and additional security APIs for advanced security controls.



Comprehensive security suite in IMDG.

Advantages

- **Fast.** IMDG demonstrates more operations per second versus other comparable in-memory technologies.
- **Scalable.** Easily add more nodes; no complex pre-planning or manual intervention.
- **Easy.** IMDG can be deployed in embedded mode in apps or as a client-server installation and offers an easy API for building sophisticated distributed apps.
- **Reliable.** IMDG runs 24/7 deployments with safeguards against data loss and data duplication, even upon node failure.
- **Secure.** IMDG offers a full security suite to protect your data from unauthorized access.

Example Use Cases

- **Digital integration hub/ high-performance data layer.** Database acceleration, mobile/ web application acceleration, mainframe optimization.
- **Payment processing.** Fraud detection, payment settlement processing.
- **E-commerce.** Real-time inventory management, online product catalog, m-commerce app acceleration.
- **Microservices optimization.** Microservices communications/ messaging, state management.
- **Caching.** Cache-as-a-service, database caching.
- **Analytics.** Real-time ingestion and indexing, real-time querying.

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WAN Replication (Enterprise version only). IMDG efficiently replicates data to a remote cluster for disaster recovery (DR), geo-distribution, or multi-cloud strategies; supports active-active or active-passive topologies. **Automatic Failover** lets clients automatically switch to the secondary cluster should the first cluster become inaccessible.

CP Subsystem. IMDG provides strong consistency on data structures used for counters, unique IDs, and locks in a fault-tolerant deployment. **CP Subsystem Persistence (Enterprise and Pro versions only)** stores data to disk to enable fast recovery should the cluster be restarted.

Hazelcast offers the following commercial versions in addition to the open source version.

Hazelcast IMDG Pro	Hazelcast IMDG Enterprise
▪ All capabilities in open source Hazelcast IMDG ▪ Professional support (Pro level) ▪ Hot Restart Store ▪ CP Subsystem Persistence ▪ OpenShift support ▪ VMware Tanzu support ▪ Unlimited Management Center	▪ All capabilities in Hazelcast Jet Pro ▪ Professional support (Enterprise level) ▪ Intel Optane PMem support ▪ Security Suite ▪ WAN Replication ▪ Automatic Failover ▪ High-Density Memory Store ▪ Blue/Green Deployment ▪ Rolling Upgrade

To get started with Hazelcast IMDG, visit https://hazelcast.com/products/imdg/#learn.