



Advanced Solutions for Today's Technology

Move at the Speed of ATHENA™

+ Demaratech's **ATHENA™** Technology securely moves data at incredible speeds over existing hardware, delivery channels, and infrastructure. By gathering the brightest minds to create ATHENA™ technology, Demaratech will change the way the world moves, stores, and accesses data.

Built into ATHENA™ Technology is a Pattern Processing Engine, which has the ability to be repurposed in both horizontal and vertical industry segments with data handling needs. The Pattern Processing Engine which makes up the core of ATHENA™ can determine and process patterns within data such as anomaly detection, object identification, noise filtering, compression, security/digital rights management, and encryption. With these capabilities, Demaratech is able to create solutions for some of the most challenging data handling problems in the world today.

Deploying ATHENA™ Technology within a database offers numerous benefits, from enhanced disaster recovery scenarios to new search functions for compressed blobs. From reducing storage requirements for transaction logs to providing new capabilities in real-time cross-system database communications, ATHENA™ enables a new range of capabilities to be delivered to enterprises while it drives down storage costs.

Keep In Sync

Disaster recovery is a key offering for database suppliers. Yet replication of transaction logs remains a challenge, as to date lossless data compression has been limited to relatively low ratios. With higher lossless data compression rates, new approaches to log shipping can be realized.

With the **ATHENA Symmetry™** Lossless Compression, dramatically reducing transaction log size will lower the synchronization interval period and enables more frequent log shipments to take place, allowing database vendors to offer the same database state in multiple locations. Many technologies today are attempting to offer virtualized database access, yet none achieved the near real-time availability of two databases in the same state at multiple locations (i.e. horizontal scalability of a database). ATHENA Symmetry™ can enable this horizontal scalability of a database engine, enabling regional transactional input while maintaining complete access to the entire dataset for all users.

To achieve horizontal database scalability, a distributed solution is required in all layers. Planning for increasing number of clients in a distributed solution has left database architects with few real choices for scalability. Most popular is scaling out the Front-End Layer (i.e. Web-Servers) and/or scaling out the Middle Tier Layer (i.e. Application Servers); this requires the Business Logic for the data to be part of the Application Layer. The net effect with this approach has been the ability to accept a larger number of incoming requests, while limiting access to key data. Any distributed solutions which are data or information intensive typically requires the Application Layer to reach into the Data-Layer (or database engine). It is at this stage where the "scaling-out" bottleneck exists. Access between these two layers has been limited up to now because only one database could contain an entire dataset.

To date, strategies for scaling database technologies have been limited to:

- Vertical scalability approaches (i.e. adding more memory, compute power, disks & storage or network bandwidth) for the Data-Layer
- Clustering technologies to address the high-availability of the database server (but not scalability)
- Log-shipping to address disaster recovery technologies
- Mirroring to address high-availability of the database resources
- Grid technologies to address virtualization of all resources including database
- Database partitioning to address the ability to section the requests into the data layer by a distinguishing aspect or piece of information in the request.

Even when combined, these strategies have not been able to achieve the goal of making a complete database (engine and resources) available in an identical state at multiple locations. That would translate into the elusive achievement of horizontal scalability. ATHENA Symmetry™ will enable such horizontal scaling.



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Needle in a Haystack

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While there are many search techniques, rapidly searching within compressed blobs remains an elusive capability for database suppliers. With **ATHENA Search™** Pattern Matching, finding even the smallest pattern within compressed blobs of data is now possible. Without decompressing an entire blob, it is now possible to search within that compressed data set for a particular pattern. Whether it is searching images, videos, or text, ATHENA Search™ can enable faster operations within a database.

While there are various techniques to employ searching over binary or large database fields (BLOBs, CLOBs, XML, etc), none of them work at high performance required typically for a database query. The “set” oriented aspect of a query, that requires high speed processing across all BLOBs, has two inherent problems. First, BLOBs are typically very large and second, the indexing and searching across those large fields is too slow. Creation of indexes across these fields is somewhat effective, it does not allow for an intelligent search that goes beyond the content of the index. It is not possible to look for patterns in the index, only in the original data. Bringing effective and revolutionary pattern matching within the compressed data into this process alleviates both problems. The size of the BLOBs can be dramatically reduced, as well as the search capabilities extended to finding patterns across the blobs, which would create a unique feature in a database engine.

Any Road a Highway

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Most of the Enterprises today make use, in one form or another, of integration products to bridge their back-end systems. According to Gartner, an enterprise has an average of 7 Platforms in their back-end data centers, and enterprises that do not have or at least create a stolid integration strategy will not be able to sustain competition over the next ten years. Many integration strategies evolve around messaging technologies that allow for loosely coupled integration of the disparate platforms. Most messaging technologies make use of a database engine as a persistent store for the messages that flow between the disparate platforms & systems. More sophisticated messaging products need to be able to handle very large messages and very large numbers of messages as they flow through a database. The distinguishing factor between such messaging products is their ability to handle these very large messages in large numbers. It is this aspect that constrains the scaling of nearly all messaging products in use today.

By implementing ATHENA Symmetry™ Lossless Compression within the end-point integration functions of a given messaging product, the compressed data passes more efficiently through the gateway and will speed the message delivery process; and, by using a single-pass decompression routine at the integration end-points, rapid processing of large messages is enabled. Additionally, as messages pass through the gateway, ATHENA Search™ has the unique ability to scan compressed messages for pre-determined data (or patterns). This enables the gateway to perform related business routing and mapping activities (i.e. promotion and identification of message content), while at the same time grants the overall messaging infrastructure an end-to-end ability to work in compressed state from data sources to data destinations.

It's Under Lock & Key

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For data, especially large BLOBs, that need to be encrypted, **ATHENA Secure™** can be applied to ensure access is limited to certain data fields, such as medical images or voice recordings. When combined with our decoder technology, compressed blobs can be further secured with **ATHENA Shield™** when integrated with either our embedded digital rights management solutions or those from third-parties.

ATHENA™ Technology for Database Solutions is comprised of

- ATHENA Symmetry™ Lossless Compression
- ATHENA Search™ Pattern Matching
- ATHENA Secure™ Data Encryption
- ATHENA Shield™ Digital Rights Management