IBM® Sterling Order Management Scalability

Promising and Inventory Hub and Marketplace Inventory Server Proof of Concept

Executive summary

Providing a superior omni-channel customer experience is more complex than it has ever been. Customers not only demand more choices in products, but also more choices in where those products can be purchased and fulfilled. Selling a product does not end with taking the order. It requires collaboration with outside suppliers and intelligent systems to determine the most efficient location to fulfill the item being purchased. It requires visibility and communication across all sales channels to deliver the same consistent experience for the customer. Providing accurate inventory availability and promise dates across all channels can be challenging for organizations and can slow down an order management system that is not built for this type of processing.

In addition, some retailers are expanding their business to include marketplaces so that they can sell other vendors' products on their website to provide greater selection for consumers and to reduce directly owned inventory. In a marketplace model, a customer places an order on the retailer's website for items that are fulfilled by a third party vendor. To enable a marketplace model, retailers need to maintain a robust integration with their marketplace vendors to get accurate inventory availability and to orchestrate order communication. With thousands of vendors, each carrying thousands of items, the integration puts extremely high demands on the retailer's systems.

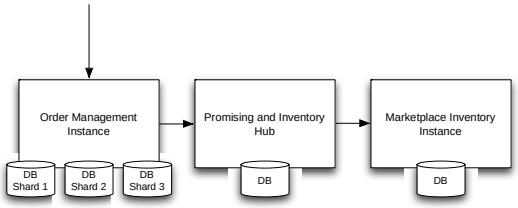
To maintain a competitive advantage, increase market share, and provide the scalability needed as demand increases, companies need a central system that can serve as the source for inventory and promising information. It must also share inventory across multiple channels, newly acquired businesses, and external vendors; and provide multiple fulfillment options, while minimizing excess inventory across the supply chain.

IBM® Sterling Order Management, with custom code enhancements[1], can serve as a ***promising and inventory hub*** and a ***marketplace inventory server*** to achieve transaction volumes that are consistent with those of the largest omni-channel retailers on peak selling days. This solution can also meet the needs of retailers looking to expand their growth with a marketplace model, where they are communicating with thousands of external vendors.

Innovative deployment model increases scalability

A leading retailer commissioned IBM to develop and execute a proof-of-concept benchmark to assess how an order management system running Sterling Order Management, integrated with a promising and inventory hub, would scale when processing heavy order and inventory transaction volumes under two operational scenarios. This proof-of-concept benchmark integrated three Sterling Order Management instances to implement:

- order management
- centralized promising and inventory
- marketplace inventory capabilities



In the diagram, the order management instance was configured to process and manage orders coming from multiple sales channels. This instance calls the promising and inventory hub for all availability information. The promising and inventory hub calls the marketplace inventory instance if it needs marketplace supply information.

The three instances were integrated through the use of well-defined extension points in Sterling Order Management. For scalability, the order management instance used the sharding feature[1] to distribute the order processing over three database shards. Each database shard is its own DB2 instance running on its own physical server.

Results show very high scalability

The benchmark configuration above was tested under two different operational scenarios.

The first scenario simulated a retail operation where the Sterling Order Management solution was used to manage the end-to-end order fulfillment process with inventory maintained in the promising and inventory hub, and the marketplace inventory instance. In this scenario, during the steady state, the application processed the following workloads within a single hour:

- 2.8 million lines created per hour
- 2.8 million lines scheduled per hour
- 2.8 million lines released per hour
- 3.0 million find inventory calls per hour
- 300K reserve inventory calls per hour

This first scenario demonstrates that Sterling Order Management, configured with a

[1] Planning Statement: IBM plans to deliver in future release. All such statements regarding IBM's plans, directions, and intent are subject to change or withdrawal without notice.

centralized promising and inventory hub and marketplace inventory instance, can scale to accommodate sales volumes that are typically seen by the top omni-channel retailers on Black Friday and Cyber Monday.

The second scenario simulated a nighttime operation where external marketplace vendors and internal inventory masters (e.g. retail stores) sent in inventory availability information to the promising and inventory hub and marketplace inventory instance. As part of the proof-of-concept, the Load Inventory processes were modified to scale to the higher volumes. With the changes, this scenario was able to process:

- 16.25 million updates into the Promising Server for 1,050 stores in parallel with
- 92.5 million updates into the Marketplace configuration from 550 external suppliers

This created a total of 108.75 million inventory updates, which resulted in 21.75 million inventory adjustments in a three hour window.

This second scenario demonstrates that Sterling Order Management can deliver the volumes expected in a marketplace model which are much higher than what our current customers are driving through the solution.

Proof of concept configuration

The proof of concept was conducted on the following configuration:

- IBM Sterling Order Management 9.2 with custom code enhancements to:
  - Load Inventory Processes
  - Inventory Transactions
  - Inventory Purge Agents
- IBM DB2 ® 9.7 Fix Pack 6
- Five database LPARs, each LPAR configured with:
  - 48 POWER7 3.1 GHz cores
  - 288 GB RAM
- Nineteen application and agent LPARs, each LPAR configured with:
  - 16 POWER7 3.1 GHz cores
  - 96 GB RAM
- Five message queue LPARs, each LPAR configured with:
  - 4 POWER7 3.1 GHz cores
  - 24 GB RAM
- Two IBM System Storage® S8800

The 29 LPARs above were implemented on three IBM Power 795 servers, each equipped with 256 POWER7® 3.1 GHz SMT4 cores. The storage was comprised of two enterprise-class IBM System Storage DS8800 storage devices.

Performance far exceeds requirements

This customer commissioned proof-of-concept benchmark shows how IBM solutions can help omni-channel retailers scale to extremely high transaction volumes during their peak selling days and can help manage the inventory synchronization demands of a large marketplace. This scalability provides IBM clients with the flexibility and confidence to address the ever-increasing demands of a superior omni-channel customer experience, while expanding into new business areas. The approach and design principles used in this benchmark continue IBM's strong heritage of research and innovation.

Why IBM?

As part of the IBM Smarter Commerce® family of solutions, Sterling Order Management can add value on its own or be combined with other Smarter Commerce software solutions, as well as hardware and services, to provide the performance and the scalability needed to help ensure that products and services will be fulfilled accurately and efficiently across channels.

For more information

To learn more about Sterling Order Management, please contact your IBM representative or IBM Business Partner, or visit: **ibm.com**/software/commerce/order-management/

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