The Informix Alternative

Demands for 24/7 availability continue to expand. Not only conventional transaction processing systems, but also, increasingly, data warehouses, e-commerce, social media, CRM another applications are becoming “business-critical” in the sense that downtime must be avoided.

Organizations are faced with the need to put high availability clusters in place for a growing number of systems. But these may be expensive. Costs of software licenses, as well as of implementation, operation and support may prove daunting even for large, well-funded IT operations. For small and midsize businesses, costs may be prohibitive.

These issues are familiar to organizations considering deployment of Oracle Databases and Real Application Clusters (RAC). They should, however, be aware that there is an alternative. IBM Informix offers enterprise-class database availability in a significantly less complex, less expensive manner.

IBM Informix is one of the world’s most widely used databases. Its more than 200,000 customers range from Fortune 100 corporations to small businesses. Its growth has outpaced the relational market as a whole. Informix is supported by more than 3,000 IBM business partners, and enjoys exceptional levels of customer satisfaction and loyalty.

Informix deployment has been driven by its strengths in replication – Informix employs one of the industry’s most scalable and efficient replication architectures – and data management. It also combines strengths in embedded data management with low administrative overhead, highly effective use of server resources and enterprise-class resilience.

Established Informix strengths have been significantly reinforced by regular new releases over the years. Informix Flexible Grid offers compelling capabilities for highly efficient change management, workload balancing, and enterprise-class failover and recovery in distributed database networks. Moreover, it may be deployed and provisioned on heterogeneous, commodity hardware, supporting different operating systems and database versions.

Other features provide high value in centralized environments. In both types of deployment, Informix represents an alternative to Oracle databases and Real Application Clusters (RAC). In addition to functional benefits, Informix offers significantly lower costs.

In representative distributed deployments detailed in this report, for example, three-year costs for use of Informix Flexible Grid averaged almost two-thirds less than for use of Oracle Database 12c and RAC. For centralized high availability deployments, Informix costs averaged 45 percent less.
Informix Flexible Grid

One major area of Informix popularity has been in geographically distributed database applications. Customers include some of the world’s largest retailers, financial services companies, hotel chains, distributors, manufacturers, insurers and government agencies. Installations with thousands of remote nodes are common, with the largest exceeding 10,000 nodes.

The introduction of Informix Flexible Grid in October 2010 significantly expanded Informix capabilities for such applications. It introduced the ability for organizations to create grid topologies that enable transparent, any-to-any application failover across diverse platforms at any number of sites.

Informix Flexible Grid employs large-scale mechanisms that allow servers to be easily provisioned, updated and removed. Data definition language (DDL) operations may be performed, tables updated and workloads balanced across the entire grid. Data may be backed up to, and restored from cloud storage.

Customers include not only large companies and government agencies, but also small and midsize organizations. The largest Informix Flexible Grid users surveyed for this report employed 1,000+ nodes, and the smallest reported significant gains in supporting two remote sites. Similar experiences were reported for installations in the 5- to 100-site range.

For organizations of all sizes, Informix Flexible Grid provides a more cost-effective alternative to topologies built around Oracle RAC.

For example, in representative large installations in six industries, overall three-year costs for use of Informix Flexible Grid averaged 69 percent less than for use of Oracle Database 12c with RAC. Figure 1 illustrates these results.

![Figure 1: Three-Year Costs for Use of Informix 12 Flexible Grid versus Oracle Database 12c and Real Application Clusters for Distributed Deployments – Large Installations](image)

In six midsize installations in these and other industries, overall three-year costs for use of Informix Flexible Grid averaged 43 percent less. Figure 2 illustrates these results.

![Figure 2: Three-Year Costs for Use of Informix 12 Flexible Grid versus Oracle Database 12c and Real Application Clusters for Distributed Deployments – Midsize Installations](image)
Comparing IBM Informix and Oracle Database for High Availability and Data Replication

International Technology Group
January 2014

Cost calculations are based on topologies built around Informix 12 Enterprise Edition and Oracle Database 12c Enterprise Edition with RAC in larger sites; and Informix Workgroup Edition and Oracle Database 12c Standard Edition, which includes RAC, in smaller sites.

It would be prohibitively expensive to employ Oracle Database Enterprise Edition at small sites. The costs of Oracle’s preferred replication solution, GoldenGate, would also be unrealistic. For this reason, Oracle Database Standard Edition and a less expensive third-party replication tool were employed.

Calculations include software license and three-year support costs for databases, clustering and replication tools. Personnel costs are for full time equivalent database administrators (FTE DBAs). These are calculated based on prevailing average salaries for individuals with appropriate skill sets.

Allowance is also made for differences in server costs. Informix Flexible Grid requires single servers at remote sites, and in many cases allows existing hardware to be employed. Oracle RAC requires a dual-server cluster of identical hardware and software configurations, resulting in a higher percentage of server upgrades as well as addition of a second server.

Calculations allow for replacement of between 15 and 100 percent of existing servers, depending on installations, along with second RAC servers. Costs include acquisition of x86 server hardware – primarily Dell, Hewlett-Packard (HP) and IBM machines – and operating system (Microsoft Windows Server or Linux) software, as well as three years of hardware maintenance and software support.

Six large installations employed for cost comparisons are in banking, government, hospitality, insurance, logistics services and retail organizations with between 100 and more than 1,000 remote sites. Six midsize installations are in agribusiness, government, manufacturing, retail, transportation and wholesale distribution organizations with between 8 and 80 remote sites.

Representative installations were constructed using input from 42 Informix and 40 Oracle RAC users in these industries. The basis of these calculations, including descriptions of installations and methodology, is outlined in the Detailed Data section. Detailed cost breakdowns may also be found in this section.

Centralized Deployments

Informix has also been widely deployed for high availability clusters supporting centralized business-critical systems. In this role, Informix offers equivalent functionality to Oracle RAC at a significantly lower cost. This is the case whether it is deployed on UNIX or on x86 Windows or Linux servers.

In representative UNIX server installations in six industries, for example, three-year costs for use of the latest Informix 12 averaged 54 percent less than for use of Oracle Database 12c with RAC. Figure 3 illustrates these results.

![Figure 3: Three-Year Costs for Use of Informix 12 versus Oracle Database 12c and Real Application Clusters for Centralized UNIX Server Deployments](image-url)
In x86 server installations in these and other industries, three-year costs for use of Informix 12 averaged 28 percent less. Figure 4 illustrates these results.

![Figure 4: Three-Year Costs for Use of Informix 12 versus Oracle Database 12c and Real Application Clusters for Centralized x86 Server Deployments](image)

Calculations include license and support costs for Informix 12 Enterprise Edition, and for Oracle Database 12c Enterprise Edition with RAC plus GoldenGate and/or Active Data Guard where appropriate. Personnel costs are for FTE DBAs for a three-year period. Deployment costs are for external assistance during implementation.

UNIX server installations employ IBM Power or Oracle SPARC T5 or M Series systems. x86 servers include Intel E5- and E7-based models with Windows or Linux.

Because Oracle’s pricing model tends to favor Intel-based platforms, Oracle software costs relative to Informix 12 are lower for x86 than UNIX servers. Informix 12 personnel costs, however, averaged 55 percent and 52 percent less for UNIX and x86 servers respectively, while deployment costs averaged 41 percent and 58 percent less.

Lower Informix 12 personnel costs reflect the greater complexity and lower automation levels of the Oracle database and RAC environment. Among organizations surveyed for this report, FTE DBA staffing for centralized Informix deployments was typically estimated at two or more times less than for Oracle databases with RAC.

Degrees of complexity also affect deployment times. For example, Oracle RAC users reported that systems were brought into production in two weeks to 10 months – most responses were in the four-week to six-month range – with an average of around 118 days. In comparison, Informix users reported eight days to three months, with an average of around 57 days.

Installations were based on input from a 29 Oracle RAC and 21 Informix high availability users in the same industries. As for distributed comparisons, the basis of these calculations, along with cost breakdowns for all installations may also be found in the Detailed Data section of this report.

**Capability Differences**

**Core Designs**

Cost disparities reflect important capability differences. Informix, for example, is built around an “object relational” design combining SQL and object-oriented architecture. This provides greater flexibility in creating and managing data structures, and has enabled Informix to integrate new data types in a comparatively simple manner.

Informix incorporates software-based virtual processors (VPs). These are dedicated to handling specific tasks such as SQL execution, threading, and memory, I/O and communications management. VPs enable high levels of configuration flexibility, materially improve the efficiency with which complex, diverse workloads are executed and contribute to performance, scalability and manageability.
In these and other areas, Informix employs streamlined, lightweight data structures that deliver high throughput and low processor overheads. Simple, automated administrative functions mean that few DBAs are required.

A further Informix characteristic is that replication, clustering and disaster recovery form part of the core Informix system architecture. In comparison, Oracle employs a “pure” relational design that has been progressively enhanced since the early 1980s through separate products and subsystems. The result is a significantly more complex environment.

Currently, Oracle high availability clustering is enabled by RAC; disaster recovery by Data Guard or the more sophisticated Active Data Guard; and replication by GoldenGate, which is now the company’s strategic direction for replication technology. Greater complexity translates into higher administrative costs and processor overhead.

**Distributed Deployments**

In distributed applications, a major difference is that, in an Oracle RAC environment, replication, high availability, workload management and other key functions are primarily located in the cluster. With Informix Flexible Grid, they are located in the network.

Informix Flexible Grid replication is conducted using a low-latency asynchronous log-based technique. Failover to any node within a geographically dispersed grid may occur automatically in seconds. Workloads may be spread across all nodes for more effective capacity utilization and maintenance of service quality.

This approach has proved popular among organizations that must maintain high levels of availability for remote office databases, but wish to avoid the costs and complexities of local failover clusters. It allows them to maintain local service not only in the event of unplanned outages, but also during planned outages for such tasks as software upgrades, database maintenance and patching.

Informix Flexible Grid may be deployed in topologies in which failover and recovery is handled purely within a grid. Figure 5 shows an example.

---

![Informix Flexible Grid Topology](image.png)

**Figure 5: Informix Flexible Grid-only Topology – Example**
In practice, users often combine Informix Flexible Grid with established high availability features such as High Availability Data Replication (HDR) and Remote Standby Server (RSS) in hybrid topologies.

HDR enables active-active clustering, employs high-speed synchronous or asynchronous replication to secondary databases, and enables failover between these at distances of up to 100 kilometers (km). In practice, up to 30 km is the norm. In these respects, HDR is similar to Oracle RAC.

Figure 6 shows an example of this approach in a major retail bank. In this case, HDR clusters are employed for databases at the bank’s central data center and major regional centers. RSS nodes – which employ asynchronous replication – are employed to maintain secure remote copies in case a disaster causes loss of HDR servers.

**Figure 6: Informix Flexible Grid Hybrid Topology – Banking Example**

Informix Flexible Grid Connection Manager forms the core of hybrid as well as grid-only topologies. It connects to all servers within a grid, including, where appropriate, HDR clusters. Statistics are collected on server characteristics, available workload capacity and status. Based on this information, client application connection requests are routed to the appropriate server based on service level agreement (SLA) targets.

Connection Manager also implements a virtualization layer that insulates Informix databases from underlying server hardware and operating systems. There is no Oracle equivalent.

**Centralized Deployments**

In centralized environments, a primary Informix server acts as the focal point. It may be coupled with a secondary HDR node in a classic local failover cluster; with one or more RSS nodes; and with a third node type, Secondary Data Server (SDS), which allows multiple servers to share a common disk array.

RSS has been adopted in a variety of roles. Large organizations often employ it at “bunker” locations designed to protect against events disabling both primary and secondary sites. It also offers near-HDR capability for organizations whose secondary sites are too far away for synchronous replication, or who wish to minimize network bandwidth costs.
HDR and SDS also allow users to offload read-only processing to secondary servers. This capability is commonly used to handle query and reporting workloads.

These options, illustrated in figure 7, offer a great deal of configuration flexibility.

![Diagram of HDR Cluster Options](image)

Figure 7: Informix 12 HDR Cluster Options

Informix centralized high availability solutions provide the same level of capability as Oracle RAC. The principal differences are that the overall Informix environment is less complex, and that acquisition and operating costs are significantly lower.

**Conclusions**

The capabilities of Informix 12 provide clear-cut value as an alternative to Oracle Database and RAC in distributed as well as centralized deployments. They also, however, have broader implications.

Growth in conventional data volumes and the emerging world of Big Data are making replication an increasingly critical feature of the IT landscape. At the same time, pressures to accelerate collection, interpretation and delivery of information are placing new stresses on database and data warehouse infrastructures.

These trends make integrated database and replication architecture – which is unique to Informix – increasingly attractive. Organizations may accelerate data management and movement processes while minimizing use of server resources and network bandwidth, reducing administrative complexities, maintaining availability and operating transparently across diverse hardware and software bases.

Organizations with longstanding Oracle commitments may argue that Oracle is their database standard. However, as far as costs are concerned, “sole source” procurements seldom represent a best practice in the IT world. Informix 12 offers an opportunity for greater cost-effectiveness.

Costs are not the only issue. Legacy data structures leave organizations ill equipped to deal with the challenges of data growth and sophistication, as well as of real-time delivery of information. Even where these challenges can be met with new add-ons and overlays, software stacks will grow increasingly complex and inefficient, and costs will escalate.

Where database infrastructures must meet the challenges of the future, Informix is an obvious candidate.
Additional Information

This ITG Executive Brief is based upon the results and methodology contained in a Management Report released by the International Technology Group. For copies of this Management Report, please email requests to Contact@ITGforInfo.com.