

INCERNO Ensures High Business Growth and Sustainable Long-Term Profitability



INCERNO
Toronto, Canada
www.incerno.com

Industry:
High Technology

Oracle Products & Services:
Oracle Coherence

Key Benefits:

- Achieved a 100% close rate with on-site demonstrations
- Performed without degradation at 160% of the required level
- Saved approximately \$240,000 in hardware costs and \$25,000 in development and maintenance costs
- Delivered a reliable competitive advantage

“The success of our business rests with reliability, performance, and price. I am confident that no one can match us on any of those fronts. The scalable performance, overall reliability, and low cost of startup and operation that we have achieved with Oracle Coherence will be very difficult to beat. And the ability to grow our business and expand our applications so cost effectively without having to redesign our architecture will give us a tremendous competitive advantage for years to come.”

– Jeff Kischuk, General Manager, INCERNO

When a power grid blackout left homes, organizations, and facilities throughout the Northeast powerless and in the dark for hours, the management team for a group of seventeen widely dispersed critical care facilities maintained complete awareness and control of operations using services provided by INCERNO, a provider of managed data technologies. From a central location, the management team was able to validate that backup power immediately came online at each site. The team also monitored each facility to make sure that the critical equipment essential for the health and well being of its 2,500 elderly residents continued to operate to specification.

Throughout the crisis period, the INCERNO system automatically facilitated the deployment of technicians in a timely and organized fashion to address any systems that needed attention. After the blackout, the management team was able to analyze how its systems and staff members responded to the crisis by reviewing the performance reports INCERNO generated. They were easily able to spot any opportunity for improvement, allowing them to better prepare for the next potential crisis.

This is only one example of the invaluable coverage that the INCERNO Service provides to help businesses reduce costs, increase service levels, save money, and mitigate risks. Monitoring and managing remote facilities and intelligent devices throughout the world is challenging enough. Capturing that information in real time, automatically initiating corrective actions in a proactive manner, providing continuous availability of

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Paul Silverthorne
President
INCERNO

the associated data with 100% reliability, and analyzing historical events and trends to improve future performance present very complex technical challenges.

Yet INCERNO subscribers are able to achieve these objectives and determine the health of their operations anytime, simply by opening a Web browser. Using Oracle Coherence—previously Tangosol Coherence—as a core technology, INCERNO manages the complex technical details necessary to deliver that level of outstanding mission-critical performance. INCERNO’s rapidly growing customer base and the applications it manages are extremely diverse. They include remote monitoring of facilities’ environmental, safety, and security parameters; the performance of heavy industrial equipment such as power generators; the in-room water temperature and other health and safety variables in nursing homes; and even the quality of food preparation in franchise fast food chains.

Scalable Performance: 5,000 Transactions per Second

By leveraging Oracle Coherence, INCERNO has been able to provide very scalable services. Although INCERNO has yet to experience the 3,000 simultaneous events specified as its production capacity, the company has processed 5,000 transactions per second in simulation tests with no discernable deterioration in performance or reliability. In many technology environments, unless the database server is extremely large and exorbitantly expensive, surges of this nature could easily flood the server and potentially drop transactions because the database tier is much harder and more expensive to scale than the application tier. Unlike the application server tier, it does not scale linearly, but with exponentially rising cost. Therefore, increasing the database server capacity to accommodate volume spikes of this magnitude was not economically feasible for INCERNO.

By taking advantage of Oracle Coherence, which provides transactional coherency of data in a cluster, INCERNO is able to manage data safely in the application tier, even when using low cost commodity hardware. Oracle Coherence allows INCERNO’s applications to scale and handle transaction surges predictably and affordably, without passing those spikes on to the database servers. Oracle Coherence is the critical component of the INCERNO strategy to meet the rigorous performance, data

integrity, and economic requirements of the company's service design specifications.

INCERNO uses the write-behind caching function that Oracle Coherence provides for database updating. This capability dramatically lightens database load and improves performance by eliminating database latency and redundant database operations. By moving database operations off the critical path and processing them asynchronously in the background, Oracle Coherence completely eliminates the database as a component of online application response time.

INCERNO takes advantage of a number of Oracle Coherence's other features to further unload the database servers. For example, an important part of INCERNO Service is its closed-loop alert notification process. When an abnormal condition is detected at a remote location, the system can automatically initiate an electronic corrective action alert directed to the right person. That alert message may require a confirmation, and failure to receive the response in the specified time may initiate an escalation action automatically. Rather than imposing the multiple reads and writes against the database for this activity, the system manages the transactions in cache, safely and securely under Oracle Coherence's control.

100% Data Reliability, Availability, and Integrity

Since INCERNO Service began in August of 2003, it has delivered continuous uninterrupted service to INCERNO subscribers—even with server and database outages—because the Oracle Coherence solution has no single points of failure. It allows INCERNO to store its transient application data in a high-speed shared cache with fault tolerance and fail over. It automatically and transparently fails over and redistributes its clustered data management services—without any loss of data or interruption of service—when a server becomes inoperative or disconnected from the network. When INCERNO adds a new server or restarts a failed server, the system adds it to the cluster. Oracle Coherence then fails services back to it, transparently redistributing the cluster load. It includes network-level fault tolerance features and transparent soft re-start capability to enable servers to self-heal.

Exceptional Quality of Service

INCERNO jobs tend to arrive in batches that could slow the system and degrade the level of service to individual users if not properly managed. Oracle Coherence automatically and dynamically distributes that workload across all the servers in a cluster, providing a consistent regulated quality of service to all users regardless of huge load changes, including server outages.

Accelerated Time to Design and Time to Market

With Oracle Coherence, INCERNO has reduced its time to design and time to market by several weeks. Because Oracle Coherence is easy to install, easy to use, and easy to manage, INCERNO's IT staff was able to get up and running with clustering in just a single afternoon—resulting in functionality and performance benefits that would have been unrealistic for the company to consider without Oracle Coherence.

INCERNO has made full use of the out-of-the-box functionality of the Oracle Coherence Web HTTP session management and replication module to accelerate startup. Oracle Coherence makes sharing and managing data in a cluster as simple as on a single server, which eliminates some of the most complicated challenges of clustering a system, particularly for applications that require high availability and data integrity. Using the clustering features, INCERNO's IT organization was able to quickly build cluster-aware processes such as cluster-wide parallel loading of the caches, cluster-wide statistics gathering, and tools for efficiently managing the running application.

Unparalleled Flexibility

INCERNO benefited from Oracle Coherence's unparalleled flexibility. The product runs on any Java application server, including mixed environments; it can also run outside of an application server. It runs on all server hardware and on all leading server operating systems. Oracle Coherence provides easy-to-use and fully-configurable caching strategies, so the cache topologies and the operational environment are not hard-coded into the application. As a result, INCERNO is able to protect its investment in this architecture, changing caching topology choices as desired without code modifications, to take full advantage of new economies and capabilities that will emerge with evolving hardware, server, and operating system technologies.

Unbeatable Competitive Advantage

Of course, the ultimate test of the INCERNO Service rests with subscribers' feedback. According to INCERNO general manager Jeff Kischuk, the typical customer's first reaction to seeing INCERNO Service was awe at the speed of the service. "To date, we have achieved a 100% close rate on all of our onsite demos. The customers love what they see," said Kischuk.

He added, "The success of our business rests with reliability, performance, and price. I am confident that no one can match us on any of those fronts. The scalable performance, overall reliability, and low cost of startup and operation that we have achieved with Oracle Coherence will be very difficult to beat. And the ability to grow our business and expand our applications so cost effectively without having to redesign our architecture will give us a tremendous competitive advantage for years to come."

Positive Effects on the Bottom Line

As a startup, INCERNO had to succeed the first time—there was no latitude in time or funding to support design errors. Making the right decision about the infrastructure architecture was of critical importance. The benefits in cost savings and system reliability, performance, and scalability resulting from choosing Oracle Coherence are significant. INCERNO has proven to perform without degradation at 160% of the requirements of a very demanding design specification.

In addition, INCERNO was able to cut hardware costs from more than \$300,000 to less than \$60,000, and eliminate several man weeks of internal software design, development, and maintenance, saving at least \$25,000. This decision also eliminated the risk of using unproven new software that could put the launch schedule in jeopardy, and it eradicated the ongoing headaches of in-house software maintenance. INCERNO substituted that effort with superior tested and proven capabilities that would not have been feasible in a homegrown design.

INCERNO reduced time to market by several weeks, if not months, with a corresponding accelerated revenue impact. This helped INCERNO's management meet the commitments made to investors, delivering the promised functionality, quality, and performance on schedule and within budget.

INCERNO is delivering a service that its customers love, achieving 100% close rate with on-site service demonstrations. The company has benefited from the removal of obstacles to profitable growth, such as the exponentially rising cost of the database infrastructure.

Oracle Coherence provides the infrastructure that will support INCERNO growth, including huge volume spikes, for the foreseeable future, providing sustained consistent and economical performance while allowing the company full flexibility in its hardware and software choices. Using Oracle Coherence, INCERNO is in a great position to continue to develop a high growth business with enviable sustainable long-term profitability. It offers what every potential customer wants: simplicity, reliability, performance, and value, and it has what every competitor hates to see: technological superiority that directly translates to superior customer service and value.

Why Oracle?

INCERNO's operating environment is quite unpredictable, and is characterized by huge surges as high as 3,000 transactions per second. The cost to deliver that level of reliability, availability, and performance with that transaction volume easily could exceed \$1 million. INCERNO had to find a solution it could implement for a fraction of that cost.

As a startup, INCERNO was under additional pressures. According to INCERNO President Paul Silverthorne, "To honor our commitments to our investors, it was vital that we go to market on schedule and within budget, and that we deliver superior quality and performance starting on day one. We had neither the time nor the money that allowed for errors in design. Selecting Oracle Coherence was critically important to our ability to deliver on our promises."

With an unwavering commitment to quality of service, INCERNO built very stringent requirements into its design specifications, not allowing budget constraints to compromise service standards. First, the system had to provide continuous availability with 100% data integrity regardless of server or database outages. Knowing that the environment would be characterized by unpredictable large volume spikes created by simultaneous transmissions of monitored data from different sources, INCERNO designers

called for the system to handle up to 3,000 simultaneous events with no degradation in performance and zero tolerance for lost data or transactions.

The system had to provide consistent individual transaction performance to all subscribers regardless of transaction volume increases, volume spikes, or shifting loads across the different applications. The load on shared enterprise resources such as database servers had to be as minimal as possible to avoid the degraded performance, nonlinear scaling, and exponentially rising costs that can result as the load increases on these resources. This was a critical success factor for INCERNO's business model. The architectural design had to support the business growth for the foreseeable future without limiting INCERNO's ability to take advantage of new hardware, software, or server economies or technological advances.

Lastly, INCERNO needed a design that would allow it to support both its initial business and its anticipated growth over multiple servers using commodity hardware in a manner that would not decrease performance.

After careful analysis, it became obvious to INCERNO that Oracle Coherence, with its unique partitioned approach to distributed caching, offered the absolute best solution. The product's design allows for unparalleled reliability, availability, performance, and scalability—exactly what INCERNO needed.

According to INCERNO's technology director Matt Lohbihler, "Oracle Coherence was the only product that we found that met all of our requirements."

Implementation Process

At the beginning of the implementation, INCERNO considered several options, including building its own homegrown solution. The company knew it could not afford to invest in expensive database server technology to satisfy all of its objectives. Price quotes for just the database hardware alone using such a design exceeded \$300,000.

"After seeing what Oracle Coherence could do for us, developing our own solution was out of the question. Even if we extended our development time by the several weeks required to build our own solution, we knew that we could not replicate the proven

performance and reliability or the exceptional in-memory data management capabilities for clustered J2EE applications and application servers available with Oracle Coherence,” said Lohbihler.

INCERNO is a provider of managed data technologies that aggregate and centralize multiple data sources from various sites so businesses can better understand, assess, and address system cost and efficiency.