# Lyon Highways monitoring center improves efficiency and safety of France's busiest roads with real-time traffic management

CORALY (Coordination et Régulation du traffic de l'Agglomération Lyonnaise) is a traffic-management system run by operators of roads in the Lyon region, which bear the heaviest traffic in France. An operator, Direction Départementale de l'Équipement du Rhône, worked with systems integrator AMEC SPIE to develop this collaborative, real-time infrastructure, which dissolves bottlenecks in minutes and improves road safety. AMEC SPIE recently moved CORALY from HP Tru64 UNIX®-based HP AlphaServer systems to an HP-UX 11i v2 environment comprising HP Integrity servers, boosting performance by 40 percent and providing the capacity for continued innovation and expansion.

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Lyon, France's second-largest city, is renowned for its cuisine, cultural riches, commercial vitality—and traffic.

Located in the heart of Europe, Lyon is a trans-European crossroads. Vehicular traffic traveling north and south converges in Lyon, at the junction of three major motorways. These roads include the Paris–Lyon highway, cited in the Guinness World Records as the scene of a 109-mile backup on February 16, 1980—the longest traffic jam on record. And the road encircling Lyon has the highest volume of traffic in Europe.

A decade ago, the public and private operators of the 106-mile network of roads serving the region decided to coordinate traffic management. Working with AMEC SPIE, France's leading telecommunication services and networks integrator, they developed a collaborative traffic-management infrastructure, CORALY (Coordination et Régulation du traffic de l'Agglomération Lyonnaise).

"CORALY is an international showcase of traffic management," says CORALY Center Director Dominique Terracher-Béard, of Direction Départementale de l'Équipement du Rhône (DDE), the Lyon public works agency that operates CORALY on behalf of its participants. "Traffic management experts from all over the world visit our control center to learn how we implemented CORALY with so many partners."

"Each partner has its own infrastructure," says Mrs. Terracher-Béard. "Using network gateways, our system brings in and transmits data across these diverse environments, which vary from the latest servers and applications to systems that are more than 15 years old. With HP technology, we make it happen seamlessly."

AMEC SPIE initially implemented CORALY on HP AlphaServer computers running the HP Tru64 UNIX operating system. This platform served CORALY well during its first decade. But as CORALY's founders envisioned a new generation of services as well as expanding partnerships, they turned to AMEC SPIE for a 21st-century platform to support their growing operations. The systems integrator met these needs by moving CORALY to an HP-UX 11i v2 environment running on two dual-processor HP Integrity rx2620 Servers and by upgrading the infrastructure's core software components, Gensym G2 and an Oracle® database.

"At first, we were concerned that the transition would disrupt our operation," says Mrs. Terracher-Béard. "But everything went smoothly and the project was completed sooner than we expected. With the performance gain of the Integrity platform, response time is now at least twice as fast and failover is transparent, ensuring business continuity. Our new platform enables us to focus on the future and continually advance CORALY."

## Managing traffic by managing information

"Most traffic between Northern and Southern Europe travels on the highways under our management, "says Mrs. Terracher-Béard. "With CORALY, we can distribute the traffic and offer motorists alternative routes, reducing both traffic jams and pollution."

The CORALY infrastructure is based on Gensym G2, a real-time, rule-driven platform for intelligent transportation management; on applications developed by AMEC SPIE that interface with partners' systems; and on an Oracle database that handles more than one million transactions every 24 hours.

Every 60 seconds, the Integrity server-based CORALY system collects data on traffic density and speed from more than 400 roadside sensors and cameras, emergency call boxes and patrol cars. The infrastructure draws this data from the local monitoring and intervention centers of its partners, which view their own segments as well as the entire network through CORALY.

At the 24x7 CORALY command center in Lyon, traffic management personnel use CORALY's rule-based, intelligent tools to analyze, predict and control traffic in real time.

Operating more than 15,000 traffic control devices, including both stoplights and dynamic digital message boards, CORALY dissolves potential bottlenecks in minutes by rerouting motorists.

Responding immediately to unplanned disruptions, the system posts alerts on accidents, congestion, road works, and other events as well as advisories on alternate routes and estimated travel times on affected roads. In the event of accidents and breakdowns, the system dispatches emergency response and repair personnel.

The public also accesses CORALY traffic information and services via a dedicated radio station (107.7 FM) and the CORALY Web site (www.coraly.com), which also runs on the Integrity platform.

"In our June 2004 survey of user satisfaction," says Mrs. Terracher-Béard, "more than 90 percent of the respondents rated our service as reliable."

## Seamless, on-schedule transition

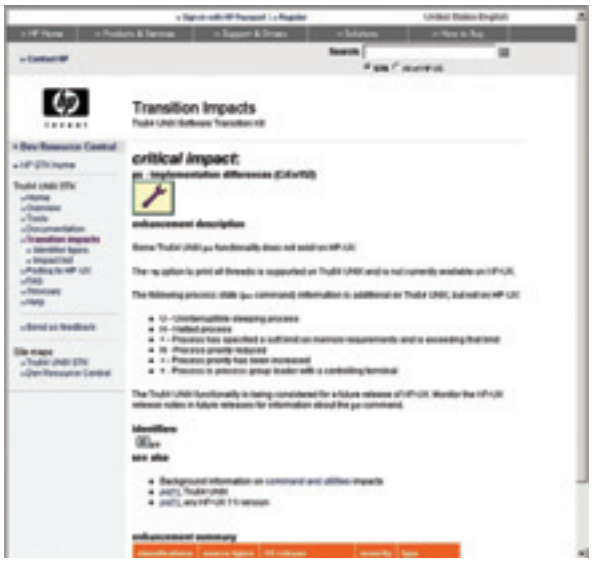
"HP has been our strong partner from the start," says Philippe Pignol, AMEC SPIE project manager for CORALY. "HP has the technology to meet our client's immediate and long-term needs for performance, availability, and support. Far more than a technology provider, HP collaborates with us to ensure the continued success of CORALY."

A disruption-free transfer to the upgraded environment was critical to CORALY, which operates on a 24x7 basis. DDE and AMEC SPIE orchestrated a transition process that did not interrupt CORALY operations, and they completed the move to the HP-UX 11i v2 environment and Integrity servers on schedule. While porting its own applications to the new platform, AMEC SPIE replaced CORALY's Oracle 7 database with an Oracle9*i* system and installed the latest version of Gensym G2.

"The entire transition was seamless," says Mr. Pignol. "HP's tools and services enabled us to smoothly and rapidly transfer our code to the HP-UX 11i v2 environment and implement a new architecture based on Integrity servers. This platform boosts performance by 40 percent. And since we moved it into production more than a year ago, the Integrity environment has had no unplanned downtime. Operators gain faster access to data as well as the ability to deploy new, data- and transaction-intensive services."

The HP Alpha RetainTrust Program provided tools and support that streamlined the transition from the AlphaServer platform to the Integrity servers. The HP account team conducted a workshop that gave the AMEC SPIE engineers a detailed overview of the differences between the AlphaServer and Integrity environments and provided guidance on various technical issues.

The HP Tru64 UNIX Software Transition Kit (STK) and the associated *Tru64 UNIX to HP-UX 11i Porting Guide* helped AMEC SPIE simplify and accelerate the process of porting 40,000 lines of C code to the HP-UX 11i v2 environment. STK pointed out compiler differences between the two operating systems and provided step-by-step guidance throughout the process, enabling developers new to the HP-UX 11i operating system to achieve their desired results within deadline.




**HP transition tools played a key role in customer transition**
HP Tru64 UNIX Software Transition Kit, shown here, helped AMEC SPIE port the customer application to HP-UX 11i v2.

HP tools also streamlined compilation and integration of the code, which communicates with applications currently running on PA-RISC servers rather than on the Itanium-based Integrity platform. The AMEC SPIE team accessed remote PA-RISC-based servers through the HP Test Drive portal to compile the code. This software interfaces with the new CORALY environment through HP ARIES, a translator that runs PA-RISC-based applications in emulation mode on HP Integrity servers.

As they began using the HP-UX environment, AMEC SPIE's system administrators and developers quickly gained facility in their new operating system by reviewing the HP Interoperability Translator Quick Reference Tool, which correlates the system management commands of the Tru64 UNIX and HP-UX operating systems.

## Open road to innovation and expansion

With upgraded application and database software running on the Integrity server-based HP-UX 11i v2 environment, CORALY can now easily adapt and enlarge the scale and reach of its services and partnerships.

"We are expanding the network of roads within the CORALY system," says Mrs. Terracher-Béard. "We are about to add the roadway to Saint-Etienne, to our southwest, as well as the highway to the Lyon Saint Exupéry Airport, which is not monitored today."

The highly scalable HP Integrity platform enables the CORALY infrastructure to easily expand to support growing partnerships and data streams as well as a host of next-generation services.

"Now we can increase the precision of the information that we provide to motorists," says Mrs. Terracher-Béard. "For example, our electronic signage will post drive times to destinations instead of simply displaying the length of a traffic jam.

"HP servers provide the high reliability, speed, and capacity we need to continue our leadership as innovators in traffic management," concludes Mrs. Terracher-Béard, "Rather than being concerned about IT, we can focus on our mission, which is to develop services that increase the efficiency and safety of our roads. We can advance CORALY with confidence."

## For more information

HP Alpha RetainTrust Program: **www.hp.com/go/art**

Tru64 UNIX to HP-UX 11i—an overview
**www.hp.com/go/tru64transition/**

HP Tru64 UNIX Software Transition Kit:
**www.hp.com/go/application-transition/**

HP Technology TestDrive: **www.testdrive.hp.com**

## Challenges

- Managing France's busiest roads in real time requires ever faster, larger, and more precise modeling
- Planned growth in services and partners outpaces capacity of existing technologies
- Dated application and database software hinders innovation

## Solution components

- HP Integrity rx2620 Servers (two)
- HP Alpha RetainTrust Program tools and support, including HP Tru64 UNIX Software Transition Kit
- Plan and implementation of hardware and software transition by systems integrator AMEC SPIE
- HP-UX 11i v2 operating system
- Oracle9*i* database
- Gensym G2 transportation management application
- C code from AMEC SPIE

## Results/Benefits

- 40% gain in processing performance supports faster, more precise traffic control
- Scalable platform keeps pace with ever-expanding operations and data streams
- Upgraded infrastructure drives continuous innovation and growth

To learn more, visit www.hp.com



4AA0-0143ENN, 03/2005

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