



Bull Transitions GCOS 8 to Open Systems — NovaScale 9000 to the Rescue

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Management Summary

New challenges arise every day, and new choices present themselves, representing new opportunities for success or failure. How people react to these challenges, and the choices they make, determines the path they take and the success that may be achieved. Never have these choices been more important than those facing the European community in the past few years. The selection of a unified currency presented many problems and fears, but also the opportunity for great economic advances for the nations involved. The choice was clear: stay the course with the tried and true national currency of the past, be it the Franc, the Lira, or the Deutchmark, or transition to the new, open currency, the Euro, making the older currencies obsolete.

The adoption of a brand new, open currency has brought about concerns from all over Europe. From the 12 members of the Economic and Monetary Union (EMU), which have adopted the new currency, as well as the three countries that did not. There were many fears, such as overall inflation, costs associated to reprogramming accounting applications, hikes in the prices for everyday items such as bread and milk, and even the cost of a bottle of wine. Implementation of the posting of dual prices, Euro and native, eliminated some of these common concerns. The introduction of the Euro has resulted in many advantages to those nations that have adopted the single, open currency concept, not the least of which is in the area of International trade. Using the Euro as the basis for foreign exchange has improved that scenario throughout Europe. **The same precepts involved in the transition from a proprietary currency to an open one also apply to what is happening in the enterprise systems arena.**

What happens when your vendor informs your CIO that the server that you rely on will receive no further enhancements, in fact, is obsolete? After the shock, dismay, and even anger, comes the reality that IT needs to adjust its long-term plans. For those who have been in the industry for many decades, we have seen this happen repeatedly, as vendors have dropped models or even left the computer business for good. The challenge is clear: **How does IT move from a closed, proprietary environment to an open world while protecting the investments made in prior architecture.** To see how Groupe Bull is preserving those investments for the GCOS 8 world, please read on.

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The World of Groupe Bull

Customers of Groupe Bull are fortunate. In Groupe Bull, they have a vendor who has survived over the past 50 years and continues to thrive as a **vendor that recognizes the changes in technology and takes advantage of them in developing customer solutions.** Groupe Bull has evolved many of its programs in the past two decades into the Open Systems arena, with the introduction of the *Escala* Family of UNIX servers and the *NovaScale* Family¹ of Windows and Linux servers. Groupe Bull also had challenged the mounting trend of many vendors to migrate customers away from mainframes, with continued growth, in terms of capacity and performance, for the *GCOS 8* proprietary systems.

The cost to any one vendor to maintain a unique architecture, however, is simply too prohibitive, unless your name is IBM. Therefore, the industry has been waiting and watching to see how Groupe Bull would respond to their many mainframe customers who have remained loyal to them but continue to grow, and require additional capabilities in an economic package. In addition, how they support the customers whose need for additional performance escalates, beyond the capability of *GCOS 8* to deliver in a price/performance manner. Well, the answer is here, and there is something good for everyone willing to accept the reality of the situation. **Bull has enabled the transition of its GCOS 8 solutions from the DPS9000 platform to an open systems NovaScale server, but not away from GCOS 8, which will remain the governing operating system, but under a high tech emulation scheme.**

Two decades ago, Bull was one of the pioneers in the emulation arena. They transitioned a base of thousands of *GCOS 6* mini-computers from the proprietary *DPS6*

and *DPS6000* to the open systems world, as represented by the predecessor to *Escala*, the *DPX20*. By creating a *GCOS 6* emulation package, *HVX*, using the AIX operating system, Groupe Bull maintained binary compatibility and was able to execute almost the entire base of *GCOS 6* applications on the new server. These *GCOS 6* applications ran even faster than on the original platform, and at a much less expensive cost. By preserving the *GCOS 6* environment, Groupe Bull protected the investment of their customers in terms of peripherals, applications and training. That experience set the path for the migration of *GCOS 8* applications to the open systems world, using the Linux operating system on a *NovaScale (Itanium 2)* platform, in a packaged, turnkey product called *NovaScale 9000*.

Development of NovaScale 9000

In 2000, Groupe Bull chartered their U.S. engineering facility in Phoenix, AZ, to develop a *GCOS 8* operating environment to enable customers to run their *GCOS 8* application set, *without modification*, on top of an embedded “open” host and operating environment. The Phoenix team selected the *IA-64* architecture from Intel and the *Linux* operating system. The internal name given to that project was *Helios*. *Helios* leveraged the Phoenix engineering team’s knowledge of the *GCOS 7 based on IA-32 (Diane)* processor and the development activities going on in Europe and the U.S. toward the development of *NovaScale* and the *FAME Scalability Switch*. *FAME* is an *IA-64* architecture designed to meet the scalability, performance, and robustness needs of both the technical and commercial arenas¹.

The generic Bull *NovaScale* high-end platform is earmarked for the high-performance computing community. The first *IA-64* release from Phoenix, *Helios 1.0*, has enabled Groupe Bull to tailor the *NovaScale 9000* platform for the OLTP

¹ See *Groupe Bull Mans the High Performance Point While Leading Migration Charge to Itanium in The Clipper Group Navigator* dated August 31, 2003 at <http://www.clipper.com/research/TCG2003040.pdf>.

commercial world represented by GCOS 8.

As with the marriage of GCOS 6 and HVX before it, Groupe Bull has used commodity building blocks to assemble an open system, IA-64 platform. (See Exhibit 1, below.) Then they devoted their engineering dollars to the creation of the GCOS 8 layer consisting of:

- The *V9000 Virtual Machine*, a GCOS 8-emulation program running under the control of the Linux operating system.
- The *IOSP*, a GCOS 8 I/O Server Processor;
- The *GNSP*, a GCOS Network Server Processor.

Using the V9000 Virtual Machine, NovaScale creates binary compatibility with the GCOS 8 operating system environment executing customer applications as if they were on a DPS9000, that is, without any change. Multiple copies of the V9000 will be able to support multiple copies of GCOS 8 in later releases. This will enable consolidation from multiple DPS systems through partitioning the NovaScale 9000 into several logical GCOS 8 streams.

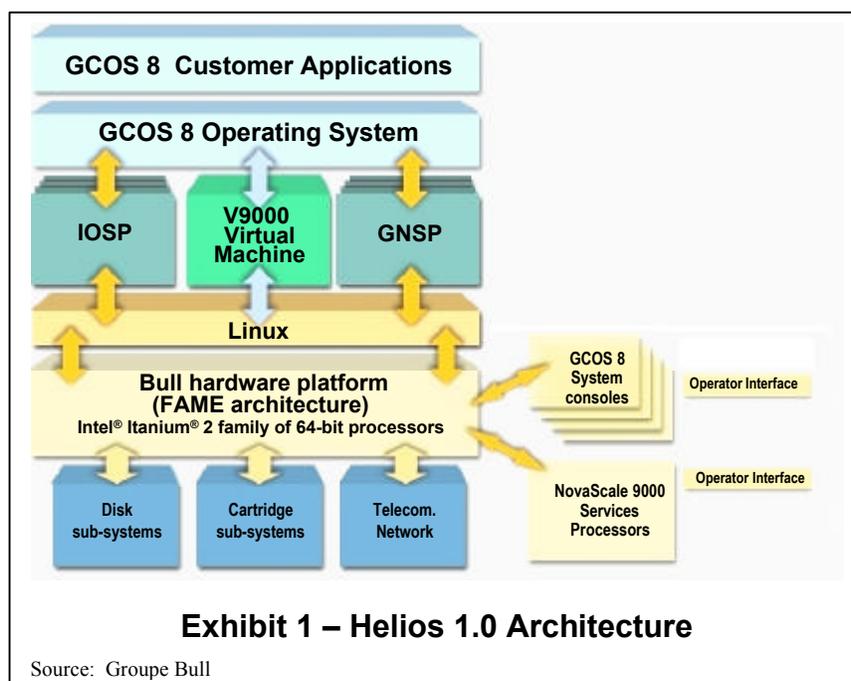
The IOSP and the GNSP provide storage and networking I/O functions, using standard drivers and commodity channel adapters. **Using the Itanium 2 roadmap made public by Intel, Groupe Bull has extended the life of GCOS 8 applications by at least 10 more years.**

However, because Bull is using commodity building blocks and the IA-64 microprocessor, the NovaScale 9000 is really a three-pronged environment consisting of three parallel operating environments, GCOS 8, Linux, and Windows. **GCOS 8 customers can begin to transition these same applications to either Windows or Linux operating systems, on the same physical platform, at a time of their choosing. They may also develop new, homegrown applications or obtain off-the-shelf applications and tailoring them to fit/interoperate between GCOS 8 and open partitions as their applications evolve.**

The Future of NovaScale 9000

In order to assess the plans for *NovaScale 9000*, IT has to evaluate both the roadmap for *Helios* from Groupe Bull, and the roadmap for the Itanium 2 architecture from Intel. In the short-term, the path for Itanium 2 is clear: *Madison* in 2003, followed by *Madison 2* in 2004 and then to *Montecito* in 2005. By using this open systems microprocessor, Groupe Bull achieves an economy of scale not available with a proprietary architecture, sharing the cost of processor development across many other vendors.

The path for *Helios* is also well defined for the immediate future. While *Helios 1.0* supports up to



4 GCOS 8 CPUs in a single partition, Helios 1.1, scheduled for availability in the first half of 2004, will enable four separate physical partitions, enhancing the scalability of NovaScale 9000. Helios 1.1 also enables the execution of Windows, in addition to Linux, in the non-GCOS 8 partitions. This is a significant step forward toward the consolidation of servers in the data center.

Helios 2.0 will provide significant new scalability features. Instead of a limit of four GCOS 8 CPUs, Helios 2.0 will support up to eight CPUs in eight physical partitions. In addition, IT can take advantage of partitioning with three logical GCOS 8 partitions for each physical partition. These changes will increase performance by 67%. Furthermore, in order to take advantage of the high performance computing features of the Itanium 2 microprocessor, Bull will create a new option: *The GCOS 8 Turbo Server Processor (GTSP)*. (See Exhibit 2.)

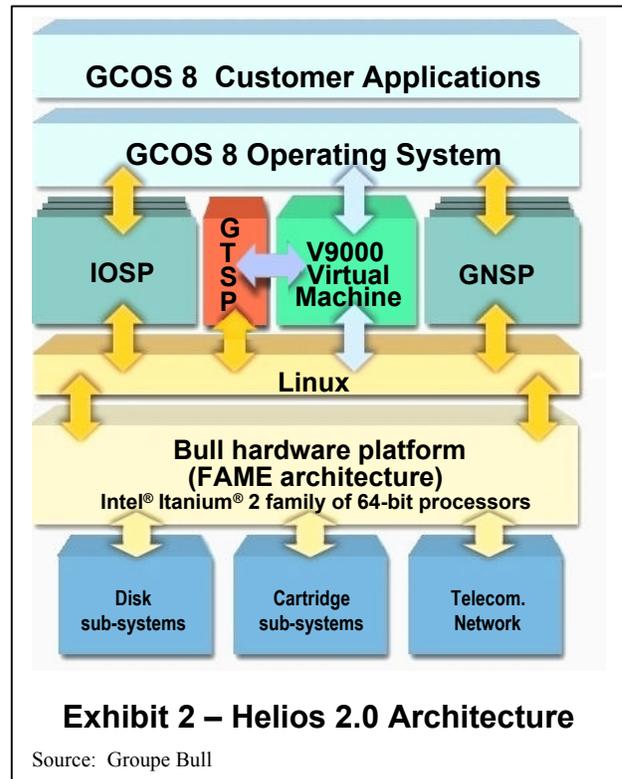
The GTSP will extend the most high use modules of the GCOS 8 operating system, such as memory management and peripheral allocation, into the native IA-64 environment, using Linux, within the V9000 Virtual Machine layer. This will provide another 65% improvement in the execution performance for NovaScale 9000. Helios 2.1, planned for the second half of 2005, will extend the scalability of NovaScale 9000 up to sixteen GCOS 8 CPUs, an advantage over the DPS9000, that has a limit of eight CPUs.

Business Value of NovaScale 9000

With an installed base of GCOS 8 customers spanning several decades, Groupe Bull has developed a bad case of “orphanitis”. This is a strange malady known to manufacturers of mainframes who have seen scores of their loyal customers lagging behind the engineering development curve due to the cost of progress and the failings of the worldwide economy.

Groupe Bull is still maintaining and providing engineering support to multiple gen-

erations of obsolete machines, mainframes that are no longer active systems in the Bull product set. However, they are still performing a vital role in mission-critical, commercial applications in their environment. The problem facing Groupe Bull is how to provide additional performance and functionality to those customers in a price-performant package.

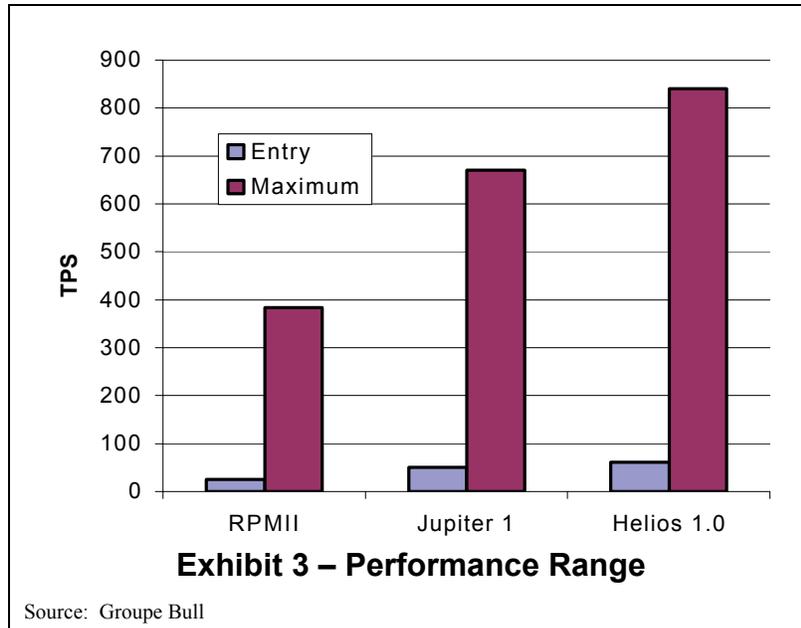


A large group of Bull mainframe customers is working on current product set. Some of them, however, are reluctant to invest further into an architecture that is unique to GCOS 8. **Although they have sufficient capacity for today’s demands, and, perhaps, for tomorrow’s as well, these users are looking for an alternate path to the future, and they are not lacking for suitors to accompany them down that aisle.**

The question they ask is: *How does NovaScale 9000 stack up with the GCOS 8 installed base in terms of performance?* In order to answer that question, let us take a look at the transactional performance of

Bull's *RPMII*, *Jupiter 1*, and the various *Olympus* platforms.

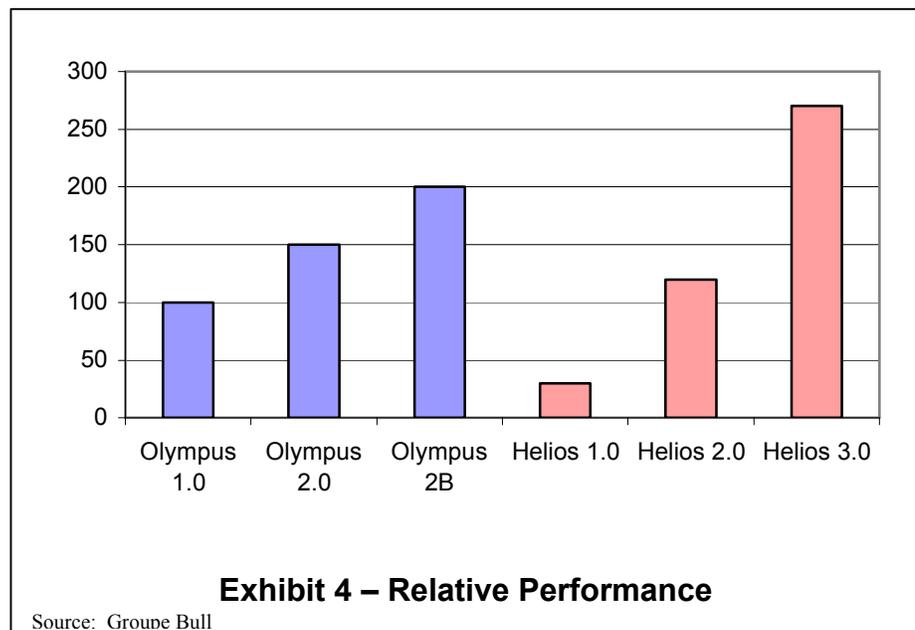
upgrading the existing platform, transition to NovaScale 9000. By maintaining the existing operating environment, the enterprise can keep all of its applications, and more importantly, it does not have to spend any money on training. Groupe Bull does have a service plan in place to assist customers in migrating their data and tape media to the Fibre Channel protocol. If you factor in the cost savings from new warranties, along with the savings from the reduced environmental requirements, the NovaScale 9000 will pay for itself very quickly.



As we see in Exhibit 3, RPMII had an upgradable performance, in terms of transactions per second, of 25 to 384, while Jupiter 1 had an entry performance rating of 51 TPS, upgradable to 671 TPS. The *NovaScale 9080* has an entry configuration value of 60 TPS at a cost of 110KE for a two-processor configuration, upgradable to 840 TPS. A four processor NovaScale 9000 (two CPUs running GCOS 8, two running Linux), with a TPS performance of 120, is currently priced at just over 120KE.

Now look at the relative performance of Olympus and NovaScale, with Olympus 1 configured with eight GCOS 8 CPUs, rated at the arbitrary value of 100. (See Exhibit 4.) Fully configured with eight CPUs, the Helios 1.0 version of NovaScale 9000 has a relative performance of 30. Do not confuse this comparison with the transactional performance from Exhibit 3.

If the enterprise data center is complaining about the performance of its RPMII or Jupiter 1, the CIO now has an affordable alternative: rather than



Helios 1.0 with eight CPUs delivers 840 TPS at a cost of 280KE, seven times the performance for 2.5 times the cost as compared to a dual-processor NovaScale system.

By the end of 2004, using the Itanium 2 roadmap from Intel, doubling the number of CPUs supported, and the inclusion of the GTSP support, NovaScale will have a relative performance rating of 120, 20% more than Olympus 1 today. Combining the roadmap for Intel for the following 2 years with a re-doubling of the CPUs supported by NovaScale, results in a relative performance of 270. This is not only 2.7 times the capability of Olympus 1 today, but it is also 35% higher than the projected value for *Olympus 2B*, at 200. **Clearly, NovaScale 9000 is not only a viable replacement for legacy products such as RPMII and Jupiter 1, but it can also be viewed as an opportunity for expansion of existing Olympus sites.**

Conclusion

Whenever you are dealing with a technological transition, there is an overlap where the two technologies intersect. In many cases, in the beginning, the new technology will be less powerful than the more established one. As we have seen from the past, however, the ramp up to advanced performance levels is relatively fast. In the case with Itanium 2, we see a schedule to transition from Madison, to Madison 2, to Montecito in rapid order. However, there will continue to be a market for the growth of CMOS-based proprietary Olympus mainframes for the immediate future. For how long is a matter for close study.

What is clear is the path that Groupe Bull has embarked upon: a convergence of server platform development based upon the Intel microprocessor technology. Taking advantage of the drastic price/performance edge available using this platform, Bull has chosen to implement a

***Best of Both Worlds* strategy for main-frame customers: putting the reliability of the GCOS 8 operating environment on top of commodity building blocks.**

Any Groupe Bull customer that is running its enterprise today on an aged platform, such as RPMII or Jupiter 1, needs to review the applicability of the NovaScale 9000 to his environment. The savings achieved from a reduction in maintenance costs and support charges along with the drastic improvement in performance will justify the transition.

While we do not expect any Olympus customer to be moving his GCOS 8 environment to Helios 1.0, these customers should be looking at the NovaScale platform for their Windows and Linux consolidation requirements today. With the roadmap to Helios 2.0 and 3.0 under implementation, this same physical platform can be viewed as a consolidation target for GCOS 8 applications in the years to come.

The planned end of the DPS9000 platform does not necessarily mean the end-of-life for GCOS 8. **NovaScale 9000 appears to be the mid-life kicker necessary to extend the business value of your GCOS 8 application set for at least another 10 years.**



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