Higher service levels and intensified competition have brought about the need for computer systems that are constantly available, without fail, no matter what. With its Parallel Sysplex Architecture, IBM® provides a technical foundation to support non-stop operations of business applications. Adabas, a database for mission-critical enterprise systems, takes full advantage of this technology’s base strengths. Adabas Cluster Services, an add-on module to Adabas, allows you to run multiple identical Adabas servers in parallel within a Parallel Sysplex cluster—transparently for the user. If one of the servers goes down, another one will take over the work, enabling you to run your Adabas-based business applications in 24/7 mode. No unplanned downtime, no single point of failure. Your organization stays online, even when a critical piece of the system fails.

Computing challenges: Rising expectations of availability

As people become more accustomed to using computers, their expectations of them change. Once users have experienced the power and speed of computing, they invariably want even more—as soon as it is needed, in the right format, all the time. These users may not realize that their higher expectations carry with them enormous demands that can only be met through performance—round-the-clock, without fail.

Intensified competition, higher service levels

Consider the financial services industry, for example. As competition has intensified, the financial services industry has worked hard to reduce costs, driving customers to increased reliance on automated services, such as automated teller machines.
The industry’s competitiveness has forced financial institutions to raise consumer expectations, and one of the results is this: Tolerance for outages at those automated teller machines is decreasing. The customer—justifiably—expects that service to be up and running, as their bank promised, whenever they want to use it. In other words, 24 hours a day, 7 days a week, all year long. How happy will that customer be when he or she is unable to access it when it’s most needed, on a weekend, while traveling, or any time when the bank is otherwise inaccessible? How can an organization, like a large bank, accommodate growth, rising expectations and business challenges, like the increasing need to tailor its offerings to individual customers—and keep up with the system requirements to do the job well? The answer lies in building the right infrastructure.

Meeting the challenges
Many of these organizations have discovered that the best thing to do is to find serious reliability and processing power, and to build solid core systems—the ones that are responsible for running their business—on the right foundation. These organizations are looking for highly scalable, enterprise-wide computing capabilities that bring value and reliability to both the business and its customers. They are looking for architectures and software that work together optimally, by design. They are looking for systems that perform under the most challenging of circumstances. Moreover, they need systems that don’t crack under pressure, that remain available continuously, through all sorts of circumstances.

Powerful systems for intense demands
Software AG’s Adabas Cluster Services offers continuous availability, serious speed, incredible processing power, and the opportunity to grow. Designed for IBM Parallel Sysplex®, it takes advantage of the platform’s base strengths and allows an organization to stay online, even when a critical piece of the system fails. The flexibility is remarkable—it offers a means to match performance with business requirements on an as-needed basis. How does it do this? First, let’s look at the underlying technologies involved.

IBM’s Sysplex technology
The architecture of IBM Parallel Sysplex is unique. It provides unprecedented advancements in terms of continuous availability and flexibility. Designed to handle the biggest, most challenging computing jobs, it relies on clustering technology—a multi-system environment that acts like a single, very powerful computer system. All the data within a Parallel Sysplex cluster can be made available to any application running on any processor, eliminating the need to keep a “spare” server ready to take over in the event of hardware or software error. Your business—and your customers—are never “stuck,” or unable to take or place an order. As your business grows, additional servers, up to 32 individual mainframe nodes, can be added to the cluster without disrupting service, with complete integrity between processors.

How it works
Here’s what it is and how it works. Parallel Sysplex is defined as two or more IBM z/OS® images in a multi-system environment using a Coupling Facility (CF) to provide high-performance data sharing, resource sharing and workload balancing. Just as you might expect from its name, the CF facilitates the coupling of two or more images (or physical machines) together, using specialized hardware and software coupling capabilities to allow efficient and reliable systems interaction. The CF is not data stored on a physical device, but works more like memory does—making it cheaper and easier to read and write. The individual processors or nodes in a Sysplex configuration cooperate in sharing workloads and resources. If one system fails, the remaining ones can immediately absorb the tasks of the unavailable system. Although the systems work together to present a single image, they run independently of each other, allowing for virtually non-disruptive installation, operation, expansion and maintenance. Varying levels of availability can be configured, with work being allocated to a more available processor when necessary. The net result is continuous availability. Your systems are up and running, no matter what happens.
Why Sysplex is different
IBM defines Parallel Sysplex as an architecture—not a product—that can be ordered by a single part number. The Sysplex architecture can be, and almost always is, tailored to meet the specific requirements of each individual installation. Implementation requires detailed planning, training and testing, and is performed in phases. Organizations looking for unhampered growth, or that require high or continuous application and system availability, can reap substantial benefits.

Built-in benefits
Some of the inherent benefits noted by IBM include the system’s dynamic method of distributing and balancing the workload, linear growth in granular increments across a wide capacity range, growth without disrupting operations, and a single point of control. The first companies that implemented IBM z Systems® chose it for the software savings—but now, it’s clear—these companies have discovered the value of eliminating unscheduled application downtime caused by system failures, declaring the most important benefit of Parallel Sysplex its continuous availability. As long as the infrastructure is in place and functioning well, no one even stops to think about the limitations that exist when a problem surfaces.

With z Systems as the foundation of your technology infrastructure, you will never have to accept strategic limits to your ability to deliver customer value.

The marriage of two technologies
It is not surprising that its high-availability features and the ability to handle a large volume of transactions mean that the Parallel Sysplex architecture is an excellent choice for optimizing online processing. Software AG, widely known for its commitment to online processing, has designed its high performance database, Adabas, to work optimally within this Parallel Sysplex architecture.
Online processing volume soars

Designed for high-speed online transaction processing, Adabas has always been known as highly reliable and able to handle the toughest computing challenges. Shortly after IBM introduced Parallel Sysplex in 1996, Adaplex I, a Sysplex-enabled version of Adabas, was released. This made Software AG the first database vendor—other than IBM—to support this architecture. Adaplex I was implemented to enable up to 32 Adabas servers to be online in parallel sharing data within one Sysplex cluster, thus creating the impression of one single image of the database. This way, throughput could be improved significantly by distributing the workload, and outages of the system could be drastically reduced.

For Adaplex I, it was assumed that 80% of database accesses were read-only accesses. Therefore, the architecture within a cluster was structured in such a way that only one server within the cluster could modify data—all others processed read-only accesses. While Adaplex I proved to be a solid foundation for Adabas Cluster Services, much has changed since 1996. More and more high-speed online transaction applications are equipped with web user interfaces and run via an intranet or the internet.

The overall trend is upward—there are more transactions to process, more reliance on high-speed online transaction systems as the foundation for core business processes. Plus many new applications are designed as Web applications right from the start. Not surprisingly, as the number of business-to-business applications grows, the rate of update transactions grows—quickly. This, along with the fact that more and more large enterprises are forced to act globally, leads to the compelling conclusion that a database must be able to handle larger amounts of update transactions, and it has to be available around the clock—24/7. Outages, if acceptable at all, must be reduced to an absolute and foreseeable minimum—so that they can be anticipated and planned for.

The ultimate Sysplex usage—why Adabas Cluster Services makes sense

But there’s a catch: Software does not automatically benefit from the Parallel Sysplex architecture’s advantages when brought into this type of environment—it must be designed with these capabilities in mind. It’s like driving a car—once you understand how fast it can go and how it handles, you adapt and drive accordingly. In the case of Parallel Sysplex, the software itself has to be designed to take advantage of the inherent benefits. Parallel Sysplex simply provides the prerequisites. For example, consider the task of replication.

When a business needs to have the same information available at multiple locations, replication is the systematic means of doing this—basically, it’s the ability to get the data in several locations. Different locations may be able to get that replicated data using different software. Sysplex is different in that it does not replicate the data, but uses the same data, with replicated software, with the main objective being to avoid outage of software. But what about where and how you keep your data? It’s equally important to rely on a solid database for that data.

Working together

That’s why Adabas Cluster Services is such a smart fit—it is optimally integrated with IBM’s Parallel Sysplex architecture to take advantage of the built-in benefits to create a continuously available database. How does Software AG do this? By maintaining a close relationship with IBM’s labs to ensure that Adabas Cluster Services is always in step with Sysplex enhancements. In fact, the Adabas Cluster Services design concepts have been discussed in detail with IBM’s Sysplex development groups to make sure that the concept is perfectly tailored to the Sysplex architecture.

Optimized for availability

Organizations face a whole new set of business challenges, and brand-new Adabas Cluster Services keeps these challenges in mind. There are several important reasons why Adabas Cluster Services is such an intelligent choice—reliability, solid options for scalability, outstanding performance, and workload balancing—simply put, it is 100% optimized for availability and performance.
Imagine a team of people working together to do a large number of diverse tasks—continuously, round-the-clock, all year long. It’s hard to imagine a team that is constantly reliable, at all times. This reliability is a reality with Adabas Cluster Services, because it is optimally integrated with the Sysplex environment to take advantage of its capabilities.

Planned or unplanned outages minimally affect the users—if they see them at all. In the event of a server failure, only a fraction of your total computing power is lost. Other servers will take over the workload, and the enterprise continues to function. The result is this: continuous applications availability—24/7. In fact, the more systems there are in the parallel Sysplex environment, the less the impact of a planned outage or failure of one of those systems. The architecture can address several causes of outages, including operator errors, system failures, and scheduled maintenance. Additionally, administrative tasks that required downtime in the past, such as reorganizing the database or turning existing data fields into key fields, can now be processed in parallel with production.

Batch jobs remain an integral part of today’s computing environment, and the pressures to keep the online environment up and running around the clock are cutting into the time formerly available for batch processing. The Sysplex clustering technology enables you to fit more work into a shrinking window.

Another key advantage with Adabas Cluster Services is its scalability. Organizations that need their systems to survive serious growth look to z/OS servers because of their inherent scalability. The Sysplex architecture offers exponential growth potential—up to 32 system servers can be added to a Parallel Sysplex system, with good scalability for capacity far exceeding any single commercial workload. Additional servers can be brought online dynamically without any downtime. Thus, long-term extensions of the system can be handled as well as peak times.
Reliable performance
The net result of designing an already high-powered, fast database for this architecture is, quite simply, excellent performance. Because the workload is distributed across multiple servers within the cluster, performance is automatically enhanced. Each user’s wait time is minimized through the balancing of the common workload. The architecture’s inherent structure makes it viable to build software that is outage-free and performance-optimized in parallel. This is the approach taken by Software AG. Because of business demands, this is where many other IT systems are also headed.

Workload balancing—like teamwork
One of the advances brought by Adabas Cluster Services is workload balancing. Imagine the exceptional team mentioned earlier. Sometimes, one team member may get overburdened, while another is not very busy. If the most suitable team member were to step in—quickly, transparently, with no explanations—and automatically do the task—that team would have the equivalent of workload balancing. Furthermore, if one team member were to get sick or take a vacation, workload balancing would mean that the other team members automatically fill in for him or her, so that no one ever realizes that the team was operating without one of its members.

In more technical terms, each Adabas server within the cluster can carry out read and write accesses, giving every application, regardless of whether it is more retrieval or update-oriented, perfect service from the database. Each incoming database call is sent automatically to the most suitable server within the cluster—usually the local one. This means that ideal workload balancing, and thus optimum performance, is ensured at every point in time. In the event of an outage of one server, planned or not, no specific activities are necessary—one of the remaining servers will take over the work. The end user will probably not even notice the outage. Adabas, perhaps best known for its ability to handle mission-critical applications, has found an ideal foundation in the Sysplex architecture.

Adabas Cluster Services and Natural
But there’s more. Adabas Cluster Services has a companion that can bring even more efficiencies. Software AG’s years of experience building applications for IBM’s Sysplex environment has also resulted in a Sysplex-enabled version of Software AG’s Natural, the 4GL-development environment. Natural is the perfect tool to access Adabas data. To further enhance the strengths of the Sysplex environment, Natural is also prepared for absolute outage-free, 24/7 availability and maximum scalability. However, that’s only part of the Natural side of the story.

The Natural advantage
While both the Natural development and runtime environments support Sysplex, the main benefit of Natural being Sysplex-capable is that it allows an organization to implement Sysplex-enabled business applications—with no additional Sysplex training, effort or knowledge required of the application developer. Natural can handle today’s requirements for state-of-the-art business applications, along with the challenges of nonstop availability, workload balancing for peak times and speed (all in parallel, of course).

Effective, efficient combination
This means that Natural developers can concentrate on the business requirements of their application, while the application knows to take advantage of the underlying technology. Even if it has been implemented in a traditional Natural environment, the business application requires no additional effort to become executable in a Parallel Sysplex environment. Therefore, the benefits of Parallel Sysplex, such as nonstop availability, scalability and optimum performance, apply not only to the development environment itself, but also to any Natural application ever implemented. Because Natural and Adabas are so synchronized and work together so effectively, the potential benefits of this architecture are at an all-time high.

Natural is executable on a Sysplex-enabled TP Monitor, CICS® or IMS™, taking full advantage of IBM’s Parallel Sysplex. Multiple Natural servers can be executed within the Sysplex cluster, with each of the Natural servers residing in CICS or IMS, while viewed as one Natural environment.
Meeting today’s most impressive challenges

If your organization faces global demands, or you require an “always-on” set of applications that are critical to your business, consider joining the ranks of companies that know how to make their systems available all the time with an infrastructure you can count on. Because there are several certainties for which successful businesses must be prepared—increased demands on computing systems, less patient customers and forever-intensifying competition. Setting expectations that are realistic is vital to any company.

Meeting the extraordinarily high expectations that are part of today’s economy is becoming increasingly difficult. How will you manage expectations if you are unable to have your systems available at all times? Will it be acceptable for your system to simply not be available? Perhaps it is time to consider putting in place the infrastructure that will take you to where performance is king, and where a low cost of ownership and nonstop reliability are the norm, not a dream.

Adabas, quite possibly with Natural, bring you a significant leap forward. Together with Adabas Cluster Services, Adabas is equipped with strength and speed to handle today’s—and tomorrow’s—toughest computing demands.
Take the next step

Contact your Software AG representative today to see how to make the most of the Internet of Things and transform your organization to meet the dynamic demands of the 21st century.

Learn more at www.softwareag.com.