

WHITE PAPER

**BS2000/OSD SERVERS S175 AND S210**  
NEW BUSINESS SERVERS FOR THE DATA CENTER



## IT Consolidation

### **The strategic approach to achieve lower costs, higher service quality and more flexibility**

Over the years many enterprises have installed large server and storage farms, while others have developed their IT on the basis of several distributed data centers. However, the consequence of both strategies is exactly the same: extremely high IT operating costs. To be successful and competitive, enterprises need to reduce these costs, and this is true not just in difficult economic times. The best ways to lower the cost of IT is to consolidate server and storage systems in enterprise data centers.

Aside from costs, other aspects are becoming more important in today's business world. Enterprises are increasingly the subject of public scrutiny, especially when it comes to the stability of business processes (business continuity), or being in line with mandatory business legislation (compliance), and accepting more responsibility for taking care of the environment and natural resources (sustainability).

In light of these challenges, mainframe servers that are deployed for centralized data processing have a number of outstanding qualities that can support large enterprises in achieving three key targets, namely: reducing operating costs, increasing service levels, and improving overall flexibility. Especially in today's turbulent economic climate, these »quiet computing powerhouses« have once again shown how essential and vital they can be for keeping business on track. Delivering even more benefits and added value to enterprise customers was the main idea behind the development of the latest generation of business servers from Fujitsu that are now ready for the market.

## BS2000/OSD Servers – the right choice

### **Proven systems for ensuring efficient IT infrastructures**

BS2000/OSD S series servers are well-known in the high-end computing segment as high-performance systems for the management of huge data volumes. Thanks to their highly developed and proven architecture, these servers have earned a reputation for delivering reliability, scalability and high availability. Easy administration and high levels of automation are also reasons why mainframes such as these still play a key role in modern data centers.

Fujitsu assigns a high priority to innovation as a long-term strategy. This is reflected in the company's heritage and years of experience in developing infrastructure solutions for managing dynamic and virtual infrastructures to meet the highest demands.

This innovative spirit is once again making its mark. To enhance proven system benefits and respond to increasing demands for higher levels of computing performance, Fujitsu has introduced two new server series for the high-end BS2000/OSD spectrum. The S175 and S210 business servers deliver significantly higher performance thanks to a newly developed CPU which will play a key role in the further development of these mainframe systems, especially in terms of reducing the costs of enterprise infrastructures.



# New High-End Mainframes in BS2000/OSD

## Highlights of the new S175 and S210 server series

The S175 and S210 business servers are positioned as the two new high-end systems in the BS2000/OSD family. Both are equipped with the most modern hardware technology. The servers differ only in terms of processor performance, configurability and scalability.

Both systems offer BS2000/OSD users in the high-end range performance requirements with regard to transaction performance, I/O bandwidth and connectivity for the high-performance peripheral systems now on the market. With the openSEAS middleware suite from Fujitsu, the servers and their applications can be seamlessly integrated in SOA applications. And it is just as easy to integrate these systems in enterprise-wide Open Storage Area Networks (SAN) using Fibre Channel connectivity.

During the development phase for these servers special attention was focused on a comprehensive concept for designing a »balanced« and complete system. The goal was not only to increase the performance of the CPU, but also to fine tune and optimize system throughput. This is reflected in the number of available Fibre Channels in the S210 system when compared to the S200 predecessor model; the number of FC interfaces has been doubled to 64 in the new server.

### OUTSTANDING FEATURES OF THE NEW BS2000/OSD SERVERS

- Newly developed processor based on 65nm technology
- Higher CPU and system performance
- Guaranteed high service level
- Support for double the number of peripheral devices
- Improved global storage performance and system capacity
- Lower energy costs and higher environmental sustainability
- Affordable entry level and high system flexibility

# S175: maximum productivity in the data center



The S175 model series offers top performance and can be enhanced with up to three CPUs. In the market segment ranging from approx. 170 to 1020 RPF<sup>1</sup>, the S175 model fulfills the middle and upper-range performance requirements for BS2000/OSD. The 1-way processor system can be precisely scaled and, depending on specific performance and availability requirements, can be expanded into a 2-way or 3-way processor system. The main memory is designed to support up to 64 GB. A hot-spare CPU which is contained in S175 Servers as standard is provided to handle system availability and security.

- Newly developed processorchip with Quad Core technology
- From one to three processors
- Standard hot-spare processor
- Monoprocessor performance of approx. 390 RPF
- Main memory of up to 64 GB max.
- Global storage up to 2 x 64 GB
- Up to 128 I/O channels
- Capacity on Demand
- Fibre Channel technology
- Low energy consumption, high environmental sustainability

<sup>1</sup> Relative Performance Factor, measured with the BS2000 benchmark of a transaction application. 1 RPF equals approx. 1.5 MIPS (Million Instructions per Second)

# S210: tailored high availability and scalability



The entry-level S210 model is equipped with two processors and can be expanded up to a 15-way system depending on specific performance and availability requirements. The S210 high-end server series in the upper BS2000/OSD performance range can deliver from approx. 990 to 5000 RPF to satisfy various customer demands. The main memory capacity has a range of up to 256 GB max. The dynamic channel sub-system (flexible assignment of the I/O channels) with up to eight I/O processors supports configuration options for up to 256 channels for peripherals connectivity. To ensure high system availability all S210 models are equipped with an additional CPU (hot-spare CPU).

- Newly developed processorchip with Quad Core technology
- From two to fifteen processors
- Standard hot-spare processor
- Monoprocessor performance of approx. 530 RPF
- Main memory of up to 256 GB max.
- Global storage of up to 2 x 128 GB
- Up to 256 I/O channels
- Capacity on Demand
- Fibre Channel technology
- Low energy consumption and very high environmental sustainability

## Advantages and benefits of the S175 and S210 business servers

- Investment protection through long-term compatible support of customer applications
- Highest levels of reliability and availability for all business data and processes
- Perfect integration of existing applications in web-capable systems
- Higher CPU and system performance
- Maximum scalability in all S175 and S210 systems
- Capacity on Demand to meet peak loads
- Outstanding security management
- Low TCO thanks to mature automation technology
- Low energy costs per system/user

Expanding the S175 and S210 models up to the next higher performance level can usually be done with the model key at the user's site. This method of enhancing performance is quite easy, and operations only need to be interrupted briefly.

The new S175 and S210 servers not only provide BS2000/OSD customers with a new pathway for growth in the high-end segment, they also support new physical and virtual consolidation options while ensuring maximum system performance and quality.

## The unique system features and benefits include:

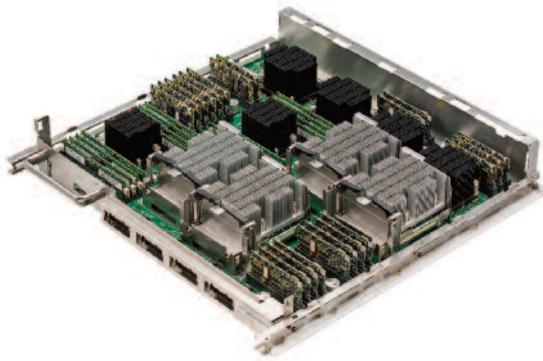
- Parallel support for tens of thousands of users in secure processing environments
- Administration and processing of even the largest data volumes
- Fully automated operation with high flexibility
- Central backup of data from various clients and servers in the enterprise

With its comprehensive BS2000/OSD product portfolio, Fujitsu is able to offer solutions that can be used to rationalize and consolidate IT environments on an individual basis, depending on the customer's needs. Due to their hardware features and qualities, the new S175 and S210 business servers are especially suited for consolidating distributed data centers.

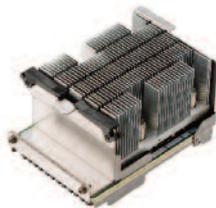
# Improved system performance

## For the first time the high-end BS2000 servers are being equipped with the newly developed quad-core processors.

The hardware of the modern S-Class servers is based on reliable and money-saving CMOS technology. The CPUs are manufactured according to standard production processes based on modern 65nm technologies (nanometer/1nm =  $10^{-9}$  m). In the high-end range up to four multi-core chips, each having four cores, are installed in the servers. This means that each system has a capacity of up to 16 CPUs max.



The increased package density on the highly integrated processor modules results in fast signal runtimes, a fact which considerably increases the performance of the processors. In addition, the optimized transfer performance within the hardware components between CPU and Cache and between CPUs (in multiprocessor systems) also contributes to the higher performance of the servers.



Furthermore, as the highly integrated structures become smaller, the modules take up less space in the systems while reducing the power consumption and heat dissipation at the same time. In terms of power consumption and heat dissipation, the new servers are 20 percent more efficient than their predecessors.

## High performance for data

Global storage (GSP) is a system enhancement that leads to more performance in the S175 and S210 systems in the high-end range. GSP enables very fast and synchronous access to stored data which are generally have to be recorded on considerably slower data discs. Due to its direct connectivity with the server's system board, GSP increases access speed by several factors when compared to hard disks.

Its storage capacity of 256 GB max. not only enhances the main memory; in an homogeneous HIPLEX<sup>2</sup> configuration it also stores the shared data. If a power failure occurs, the rechargeable batteries can easily continue operations for a period of up to 24 hours. If required up to four S series business servers can be configured to form a Highly Integrated System Complex with a total performance capacity of up to 20,000 RPF.

## Capacity on Demand

Hardware and software functions such as Capacity on Demand (CoD) offer flexible options for using system resources optimally. Integrated reserve processors are delivered with the servers so that users can react quickly and easily should peak loads suddenly occur, thus increasing performance demands. The reserve processors can be activated as needed. Since the performance required for many applications ranges between a pre-defined constant basic load and occasional limited peak loads, flexible usage models can be offered with these servers. With CoD, for example, additional CPU performance can be delivered to handle temporary heavy processing loads; the additional power is activated during running operations, and when processing returns to normal levels, the supplementary computing power is switched off. The customer has full cost transparency and only needs to pay for the performance actually used.

<sup>2</sup> HIPLEX (Highly Integrated System Complex): Fujitsu's cluster concept for BS2000/OSD servers

# High availability with intelligent concepts

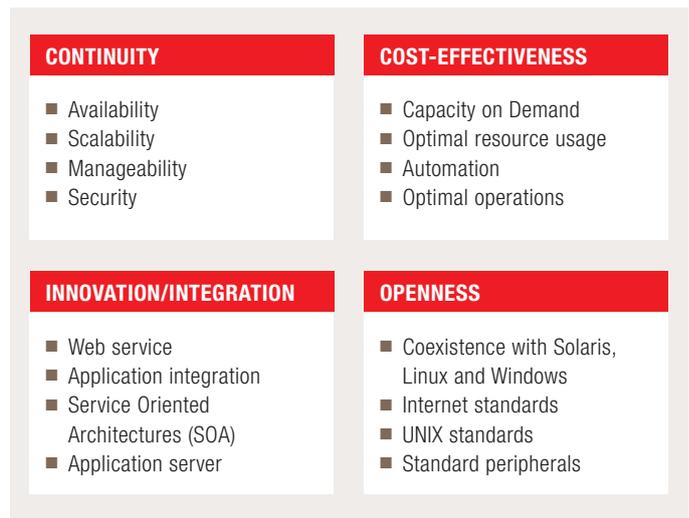
The highest levels of availability for data and applications are an absolute »must« for enterprise systems. BS2000/OSD servers are known for their extraordinary resilience and fault tolerance, which is the optimal basis for maintaining uninterrupted operations for business-critical applications. The new S-Class models are also equipped with a hot spare CPU which is activated dynamically should a system failure occur, thus ensuring smooth operations without interruptions or any loss in performance even in a »worst case« scenario.

The HIPLEX concept also contributes to high availability. Several systems monitor and control each other simultaneously, and each server is ready to act as a backup system if any one of the others in the configuration should fail. And thanks to redundant components, all applications remain in operation without any interruptions. These features translate into an availability level of up to 99.999 percent. In real terms this means that unplanned downtime is no more than five minutes per year.

To increase performance capacity and availability in a HIPLEX configuration, BS2000/OSD users can take advantage of several options based on scalability and redundancy that are relatively easy to implement. Service levels can also be increased with additional CPUs and memory modules. These add-on enhancements can usually be installed with the model key, thus extremely minimizing the downtime for the entire system.

## Virtual system concept

The VM2000 virtual system concept provides BS2000/OSD users with an additional option for scalability. VM2000 supports a flexible, load-oriented partitioning of a server to form several independent systems running in parallel. What's more, several different operating system versions can be run on one S175 or S210 server at the same time thanks to VM2000. In addition to parallel operations for production and development, migration and test scenarios can also be realized. And server resources can be dynamically assigned to guest systems and their applications whenever necessary.



## Reduced costs with BS2000/OSD servers

TCO analyses conducted by independent institutes show that centrally operated systems can save money, time and personnel due to their high levels of automation. This is especially true for those costs that are not immediately visible – they are »below the surface«, so to speak – but which make up a huge share of the expenditures. Unfortunately, when comparing IT platforms, these immense costs are often ignored or forgotten.

The prerequisite for cost reduction is a high-performance and scalable server platform. It must deliver uninterrupted performance to meet ever growing demands and, at the same time, must prevent resource conflicts related to the CPU, memory and I/O. The benefits are thus quite clear: efficient and economical use of hardware resources along with optimal use of applications and personnel.

The newly developed S175 and S210 business servers can make a major contribution to realizing an efficient and money-saving infrastructure. When compared with predecessor systems, the CPU performance S165 and S200 has been increased remarkably, and this considerably speeds up CPU-bound applications. In short this means that the performance of applications that cannot be easily scaled over several CPUs can still be improved by running more powerful servers as an alternative. Thanks to the outstanding multiprocessor features of BS2000 systems, today's /390 servers can be expanded with up to 15 processors to achieve a total performance level of some 5000 RPF that can be fully exploited for customer applications.

## SOA and cloud computing – the right infrastructure makes the difference

Service Oriented Architectures (SOA) are becoming more and more prevalent in modern data centers. However, tailored applications and the most flexible services cannot deliver optimal benefits if they are not supported by highly available and dynamic infrastructures. This is especially true when it comes to the central organization of a SOA, which makes extremely high demands on IT resources in terms of stability, reliability and availability.

When implemented in Service Oriented Architectures (SOA) the new BS2000 business servers offer best-in-class qualities such as stability, automation options, performance and scalability. They are perfectly suited for handling huge volumes of automated transactions. Furthermore, the new servers fully satisfy the growing demands for maximum data security that is especially important in SOA environments.

These SOA-relevant features are intrinsic in BS2000/OSD mainframes. It is not necessary to create them using the functions of the particular applications running in the configuration. Thanks to their very efficient resource management, the highly scalable mainframes can handle extreme peak loads and support several users in parallel with no difficulty at all. And by supporting current standards the servers easily support interoperability with other platforms.

Another promising area of application for the new high-performance servers is cloud computing. Clouds are really nothing more than highly scalable, always available and centrally managed IT platforms that can be accessed from anywhere around the world. In principle clouds demand those features and characteristics that have always been self-evident in mainframe systems for years.

In cloud computing, however, it is not only permanent availability that counts; just as important and essential is the provision of extremely scalable processing capacity. Downtimes, whether planned or unplanned, will not be accepted by customers. And that is why innovative high-availability concepts are so vital! This applies to all types of clouds, both internal as well as external. Cloud computing also calls for maximum cost-effectiveness. The minimum prerequisite to achieve this is the implementation of proven virtualization technology – for example VM2000.

## Energy-efficient systems – superior environmental sustainability



For more than 20 years Fujitsu has been known as a driving force behind the development of eco-friendly technologies and processes. A specially developed Green IT label that is attached to Fujitsu products indicates that the com-

pany's guidelines for energy efficiency and environmental sustainability have been precisely followed in all development and manufacturing processes. In fact, Fujitsu's guidelines already exceed those now mandated by law. The Green IT label reflects the comprehensive approach to environmental sustainability that is integral in Fujitsu products over their entire life cycle – this applies to materials, energy consumption and ultimately recycling. More and more customers want the assurance that they are purchasing a product designed and manufactured with the environment in mind, and which contributes to long-term sustainability through low energy consumption as well. All current server solutions from Fujitsu meet the stringent requirements defined in the Green IT label program.

In terms of environmental awareness, the new business servers are also second to none due to their outstanding »green« features. One of the most impressive is once again the reduced energy consumption. When compared with predecessor systems, the new models use 20 percent less energy thanks to their integrated multi-core processors. In addition, volatile organic compounds have been completely removed from the housing finish, which proves that saving the environment plays a major role in every system detail, no matter how small.



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