

The Fujitsu logo, consisting of the word "FUJITSU" in a red, serif font with a red infinity symbol above the letter "I".

SE infrastructure New definition of flexibility

Mainframe technology in modern
IT infrastructures



shaping tomorrow with you

Ensure maximum investment protection Innovation thanks to integration and flexibility

High-end technologies, such as those used in BS2000 mainframes, are important components in the server pool of state-of-the-art IT infrastructures when it comes to handling large amounts of data, economically serving numerous end-users with high performance, and ensuring constant availability.

For decades, BS2000 mainframe technologies have satisfied all the important requirements for running business-critical applications. They are continually being developed further in order to meet the future high demands of modern dynamic IT infrastructures in a very innovative way.

- A large number of server and operating systems can be effectively operated in parallel.
- Integration of proven and new applications in heterogeneous IT landscapes ensures optimal connections to dynamic and open IT infrastructures.

As a capable and reliable partner, Fujitsu offers its customers the best possible investment protection with IT concepts and solutions that can be flexibly configured, with state-of-the-art application innovations, and excellent Green IT technologies.

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high-performance
virtualized



high availability
scalable
automated
efficient **reliable**
flexible

Effectively meet IT requirements

Dynamic infrastructures

Our world is changing at an ever-increasing rate. Intelligent technologies drive developments and lead to a world in which conventional frontiers are overcome by a networked togetherness. The consequences are more cooperation, a greater of ideas/ experiences and new forms of life and work.

When it comes to successful stability and the competitiveness of enterprises, the flexible adaptability of business processes is a fundamental factor.

Dynamic IT infrastructures with human centric solutions are increasingly in demand and play a decisive role here. In the process, data centers have to constantly reinvent themselves. The traditional data center has long since evolved into an IT service center that operates as business partner, closely interlinked with the development, optimization and on-demand provision of business processes.

Under the notional umbrella of Human Centric Innovation, Fujitsu is committed to change and development and provides the innovative information and communication technology that brings people, information and infrastructures together.

BS2000 mainframe technologies have been powerful enablers of modernization processes for decades. They can be easily integrated into the latest IT infrastructures, offer open standard interfaces, standardized system technology and flexible system software. Outstanding performance scalability (scale-up and scale-out) and extremely high availability levels are just as natural for BS2000 mainframes as sophisticated concepts and solutions with modern virtualization, automation, management and integration technologies. The Fujitsu servers of the BS2000 SE series are high-end hybrid systems that as a result of their **openness, integration ability and manageability** open up completely new design possibilities in multi-server operation.

Solution components, such as NetStorage, virtual machines (VM2000), the appropriate middleware (openSEAS suite), state-of-the-art application development with BS2IDE or modern openNetworking functionalities, offer virtually seamless integration. Due to their further opening for maximum flexibility in the data center, in which they combine standard mainframe technology with the technologies of the open world, the new hybrid systems are setting additional standards. The SE series is the optimal platform, with uniform, central management of the entire system for the parallel operation of applications under BS2000, Linux and Windows. This helps reduce complexity in operations and at the same time creates maximum scope for design on the way to service-oriented IT operations with maximum investment protection.



- Cost control and efficiency
- Hardware consolidation
- High levels of IT availability
- High-availability networks
- Security functions
- Standardization of the infrastructure
- High performance and scalability
- Simple client connection, mobility
- Seamless integration of various platforms, applications and processes
- Maintain and develop the correct know-how
- and much more

A rock-solid base

Powerful IT thanks to innovative mainframe technologies

To meet the high demands of increasing networking and the explosive growth of transactions, mainframes are, more than ever, suited as central high-performance systems. They efficiently provide hardware resources for thousands of users as required, while simultaneously ensuring maximum flexibility and integration ability within the IT landscape. The BS2000 mainframe operating system from Fujitsu is used successfully in business-critical application environments in particular. BS2000 servers prove themselves to be tried-and-trusted platforms around the clock: extremely economical, highly scalable, process-stable and very high-performance. These are server systems that ideally combine innovation and continuity.

Automation

BS2000 offers a comprehensive and sophisticated set of functions - from automated operation and automated, cross-operating-system job processing to automatic failover. Workload management for real and virtual servers is automatically controlled and defined service levels are met for the various applications. BS2000 thus ensures:

- Low-priced administration
- Efficient utilization of operating resources
- Reliable, uninterrupted 24-hour operations

High availability

The high availability of the BS2000 can be increased to 99.999% by means of the exceptionally reliable interaction of hardware and software as well as, and numerous extended functionalities. This peak level for applications is achieved with a failover cluster and defined as the operating, load and availability cluster of several servers.

Virtualization

Virtualization, i.e. the separation of data and services from hardware resources, is a prerequisite for more flexibility in business operations. It enables far-reaching consolidations and adapts resource utilization to the changing requirements of business processes, thus significantly increasing the server workload. The virtual machine system VM2000 enables the parallel operation of different, totally segregated system environments on one server:

- Subsystems can be exchanged during live operation and different versions of a subsystem can be simultaneously run on one system.
- Databases can be accessed or removed online.
- Operating resources of a real server can be distributed over several virtual BS2000 systems online.

Availability & failover cluster

I/O-intensive processing

Individual applications

OLTP processing

Database operations

Internet services

Java applications

Standard applications

Advantages mainframes
in the modern data center

Virtualization
Storage management
Operating system
Database system
Integration Job scheduling
Print

Management

When considering the economic efficiency of IT systems over the entire IT lifecycle, the IT administration and operation costs are decisive. The intelligent system management of BS2000 ensures economic operation of mainframe applications, enables high utilization of system resources, and provides fundamental services, such as backup, archiving, print and automation functions throughout the network and on an interoperable basis.

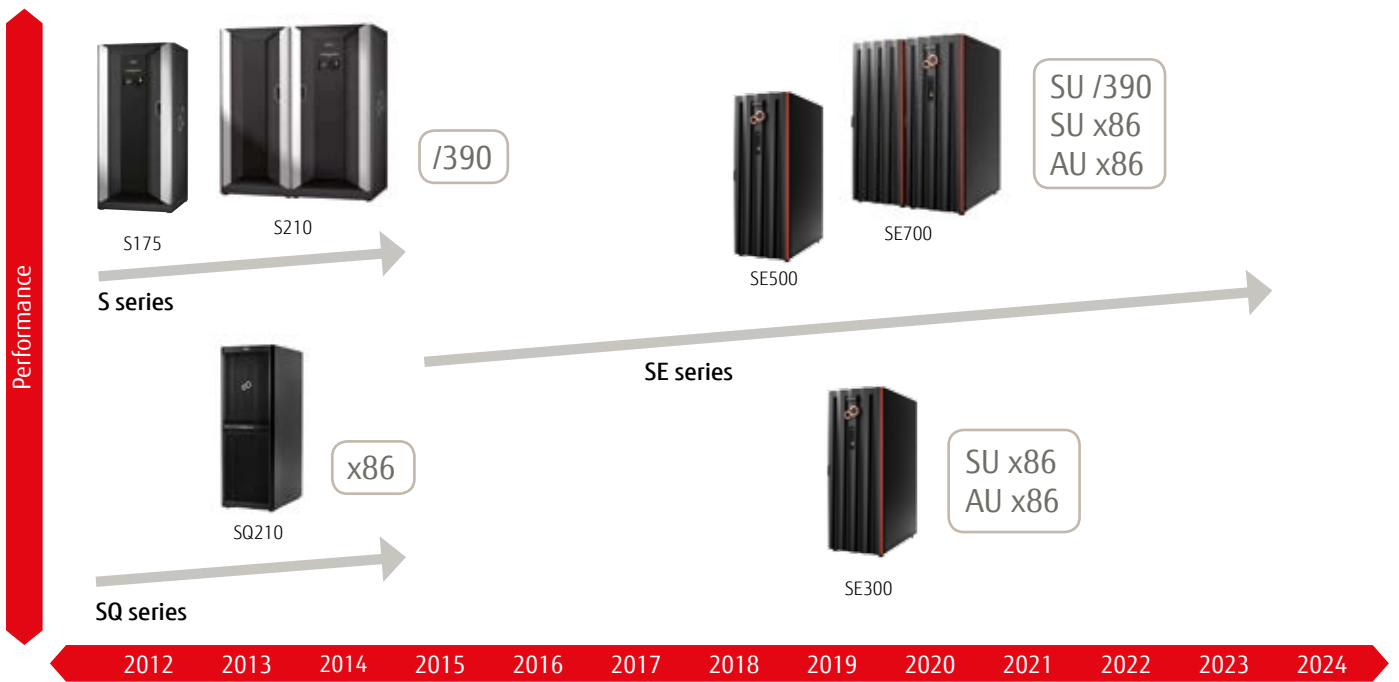
Performance and scalability

The excellent multiprocessor characteristics and associated system scalability guarantee maximum investment protection and ensure almost unlimited growth in all sectors, including the high-end range, without having to change systems.

Innovation and adaptability

The use of new technologies is an important competitive advantage and calls for adaptation. The ideal of adaptability is to harmonize the various elements in an optimal manner. In the IT world this means that existing software is changed as little as possible in order to maintain its functionality and quality and protect the investment. All changes to – or new requirements of – the software should be implemented quickly and efficiently. BS2000 mainframe technologies are continuously being developed further in line with the latest IT trends and address innovative solutions, e.g. with:

- **Middleware product suite "openSEAS"**, which makes application consolidation possible in a simple and efficient manner (from the integration of legacy applications to the modern development of web services and company portals).
- **BS2000 BS2IDE** – for modern, state-of-the-art application development.



More than 100 mainframe BS2000 software products

Fujitsu addresses all the topics relevant to modern data centers with more than 100 mainframe BS2000 software products.

SNMP management
System management

Security

Utility Performance management

Programming systems

Availability

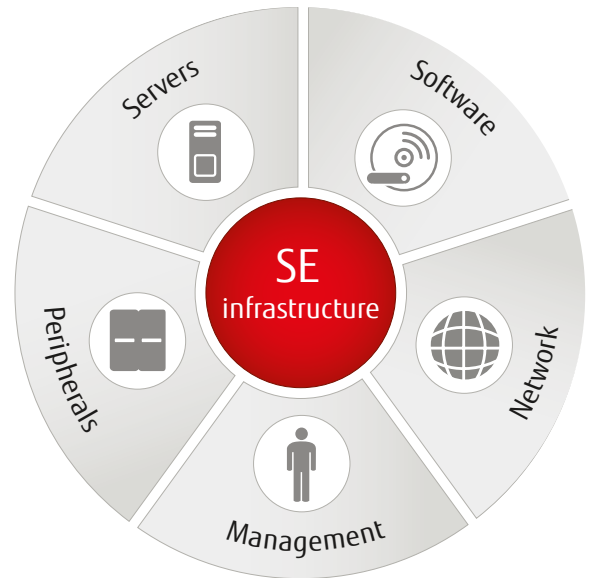
Communication & Internet
Management

Integration, continuity and dynamics

SE infrastructures

SE infrastructures

Fujitsu's BS2000 SE series of servers offers a comprehensive and autonomous server infrastructure, which ensures risk-free and efficient 7x24-hr data center operation. Its various combination options enable multiple usage scenarios for mainframes and applications in the open world. The series consists of 3 server lines and a uniform, central management concept for the entire system, including the peripherals integrated in the SE infrastructure, thus offering a very high degree of modern integration.



Servers

The FUJITSU servers in the BS2000 SE series are unique on the mainframe market. As flexibly configurable hybrid systems, they open up completely new design possibilities for freedom in multi-server operation thanks to their openness, integration ability and manageability. The SE series with its processors offers:

- Higher system performance
- Extended configuration options
- Maximum stability and availability
- Clearly reduced power consumption

Software

With its comprehensive services and functions, the BS2000 mainframe software provides optimal support for existing and new IT infrastructures. The BS2000 OSD/BC operating system has open interfaces for future-proof integration into modern application architectures. These include:

- Open standard interfaces
- Standardized system technology
- Adaptable open integration software

Management

Thanks to the SE Manager, a uniform, central management concept is ensured for the entire system that implements a very high degree of integration and uses resources optimally.

- Higher system performance with a modern, browser-based interface as a single point of administration
- Joint system monitoring of all parts and components
- Joint service concepts
- Comprehensive consolidation options through modern virtualization

Peripherals

A carefully chosen selection of peripherals is available to deliver the best value for every BS2000 performance range. The SE infrastructure uses the peripherals unit to offer sharing and joint management of integrated and external peripherals.

Network

The SE infrastructure is supplied with a "ready-to-run" network. The net unit of the SE series provides maximum performance between the SE units and to the customer network and also features maximum security. This is implemented through:

- Network virtualization
- Network isolation
- Integrated components for physical security
- Access control for logical security

Human Centric Data Center

Mainframe integration

Excellent technology

Customer feedback is incorporated in every new generation and the latest trends, technologies and IT requirements are taken into account as required.

The result of this customer-oriented development strategy is also reflected in the infrastructure of the BS2000 SE series from Fujitsu: a hybrid system with outstanding integration of the latest technologies and an innovative architecture concept. For example, the /390 and x86 hardware technologies are integrated together in a 19-inch standard rack and closely combined to form a joint infrastructure for the first time.

Concepts and solutions

Fujitsu offers cross-platform concepts and solutions that enable companies to optimally design dynamic IT infrastructures. All areas of information technology are covered - with control of key processes remaining firmly within the companies.

BS2000 provides comprehensive support for service-oriented approaches (SOA) in IT operations, thus proving itself to be an extremely scalable platform with maximum stability and the best cost structures.

The support of standards, such as SMTP, HTTP, HTTPS, FTP, XML, Java, .Net, J2EE, JCA, SSL or LDAP, ensures problem-free interoperability.

Mainframe integration

Innovative integration

Mainframe technologies, which provide stable and effective support as an integrative part of modern data centers, are among the supporting pillars in today's dynamic IT infrastructure environments.

- Integration with other server platforms
- Application integration with openSEAS suite
- Data integration
- Integration in heterogeneous multivendor networks
- Integration with storage systems and net storage

Mainframe environments, including applications, can be ideally integrated in a dynamic infrastructure environment, whether it by means of web-capable user interfaces, simple integration in portals, heterogeneous application landscapes, modern application developments or the modeling of service-oriented architectures.

End-to-end services

Fujitsu's competence in the mainframe environment is based on decades of experience and long-standing customer relationships. In addition to the quality of its mainframe technology, its excellent services and its employee competence in particular are the building blocks for this sound platform of trust.

Holistic mainframe customer consultation lays the foundations for innovative solutions and successful projects. BS2000 operations ensure risk-free and efficient data center operations 24 hours a day, 365 days a year, and can be adapted at any time to meet customer requirements.

Performant – efficient – reliable

High-end multi-server operation with BS2000

Enterprise systems require maximum data and application availability; excellent economic viability is also essential. A system must be designed and monitored in such a way that individual faults do not result in a system standstill and that all components interact optimally and effectively in a reliably coordinated manner. The SE infrastructures meet these prerequisites splendidly.

The BS2000 operating system is a highly available, scalable, high-performance basis for business-critical applications that is totally compatible across numerous versions. The open interfaces means that the BS2000 mainframe operating system offers exceptionally flexible and future-proof integration in state-of-the-art application architectures and reliably meets the IT values of dynamic data centers.

BS2000 servers

- In the server pool of service-oriented IT infrastructures, BS2000 servers are the most economical component when it comes to managing large amounts of data and supporting numerous end users efficiently, reliably, and flexibly.
- Thanks to the integration of state-of-the-art technologies, BS2000 mainframes are also eminently suited as the ideal platform for the design of new business processes.

Reliable

Mainframe-based IT technologies are unbeatably strong when it comes to maximum availability. This is mainly due to the extreme stability of BS2000 hardware and software, the minimization of errors due to easy-to-use functions, a high degree of automation, simple failover handling. In addition to the reduction in unplanned downtimes, the avoidance of planned service interruptions is increasingly gaining in significance, thus enabling support for business processes on a 24-hour basis.

Efficient

Virtualization and automation are the decisive leverage forces for service-oriented IT operation and the economic guarantee of defined service quality. Other system platforms are a long way from achieving what has long been standard practice for the BS2000. CPU utilization levels of almost 100% even for longer periods in an unbeatably efficient manner and with maximum stability thanks to the high degree of automation.

Flexible

Dynamic resource management allows numerous applications to run in parallel on the same BS2000 server system. Virtual machine technology supports various guest systems with changing loads on one server – ensuring maximum flexibility for future requirements.

An SE system is more than just a server

It is a comprehensive and autonomously acting IT infrastructure that sets new standards by superbly combining maximum performance – based on state-of-the-art processor technology with outstanding economic viability.

Excellent features

- Improved total cost of ownership thanks to a multi-server platform with uniform, integrative management concept
- Maximum flexibility for the recentralization of applications as well as the consolidation of IT operations and the resources used
- Future security and investment protection through a variety of development and growth options
- Optimal support of business processes using a uniform service concept
- Better cost control through higher transparency
- Maximum stability and availability through comprehensive automation and HA / LM concepts
- Higher security thanks to an integrated security concept
- Potential for energy savings

New definition of flexibility

FUJITSU Server BS2000 SE series



The SE infrastructures are the successors of the proven S and SQ server lines and optimally integrate the advantages of both technologies. The heart of the SE series is the /390-based server units, the x86-based server units, the net unit (NU) and the management unit (MU). All components are integrated in a 19-inch standard rack and are supplied to the customer on a "ready-to-use" basis.

The architectural concept and possible combination of mainframe and open-world technologies of the SE servers provide a new quality of openness and the ability to integrate various server and peripheral systems with simultaneously comprehensive, cross-system manageability.

Typical usage scenarios are:

- Classic mainframe operation on /390-based server hardware
- Classic mainframe operation on x86-based server hardware
- Hybrid mainframe with /390 and x86 technology for integrated or distributed applications
- Data center consolidation
- Private cloud services

FUJITSU Server BS2000 SE700

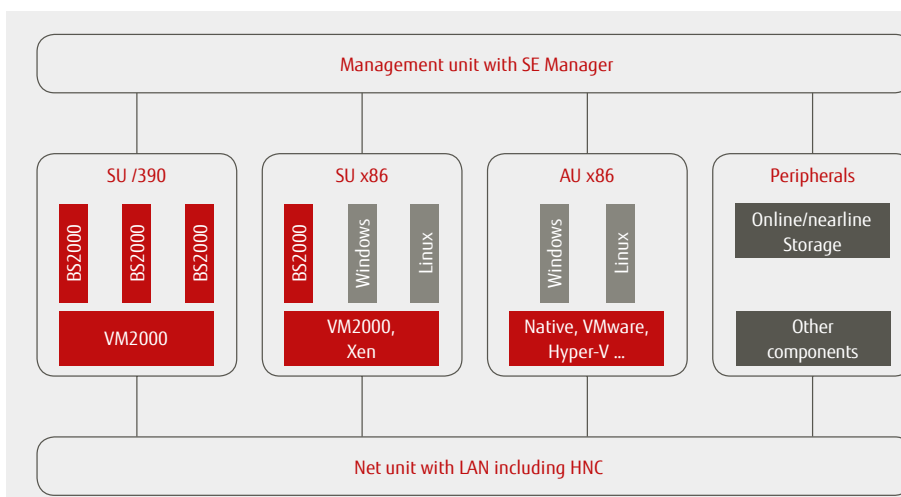
The SE server with top-level performance and flexibility for the simultaneous operation of several operating systems based on /390 architecture and high-end Intel x86 technology.

FUJITSU Server BS2000 SE500

The SE server for the medium to high-performance range with the same advantages as those of the high-end line SE700.

FUJITSU Server BS2000 SE300

The SE server for the entry-level to medium performance range - and thus specially positioned for medium-sized customers - provides highly scalable performance for the simultaneous operation of several operating systems based on high-end Intel x86 technology.



The architecture concept of the FUJITSU Server BS2000 SE series offers customers the best platform for every application scenario. The holistic management concept of the SE series considerably reduces administration and maintenance tasks, thus leading to lower costs in comparison with the operation of separate server systems.

Powerful enabler

BS2000 server as an integral component

Integration with other server platforms

- Support of recognized Internet protocol standards and services
- FTP protocols and TELNET to establish connections
- Open interfaces for trouble-free integration in heterogeneous infrastructures
- Parallel operation of other systems (Linux, Windows, VMware) on an x86-based BS2000 server
- Standardized comprehensive administration of servers, peripherals and networks
- Fibre Channel standard for modern and fast host-storage connections
- Integration in Enterprise Storage Area Network (SAN)

Integration with storage systems and net storage

BS2000 provides maximum flexibility when connecting disk storage systems in the customer's storage area network (SAN).

Extended storage integration addresses, for example, the integration of mid-range and enterprise disk storage systems used in FUJITSU ETERNUS DX systems, with clone & snap functions based on the storage host component SHC-OSD.

SHC-OSD controls the replication functions from the BS2000. Local and remote data mirroring is also possible, as is the complete integration of the snap functionality of disk systems into the automatic storage administration of BS2000.

Net storage also offers the option of storing BS2000 files that are not critical to performance in cost-effective NAS storage systems. The BS2000 files can be created directly on net storage; existing BS2000 files are copied to net storage and processed.

Integration of data and integration into heterogeneous multivendor networks

BS2000 servers with their openNetworking concept can be seamlessly integrated into heterogeneous network structures and offer end users access to data and applications in worldwide communication, support standards for best connections to heterogeneous multivendor networks or to support mobile devices, availability functions, fail-safety and the integration of existing data. Versatile Internet services for integration and use in Internet, extranet and intranet environments are also used.

openNetworking for BS2000:

- Web infrastructure, web servers
- Redundant TCP/IP network
- Standard protocols, Internet servers
- Virtual private network topologies, high-performance encryption
- High availability up to 99.999%
- Operation of 10,000 to 100,000 users and connections
- openSEAS suite, Web Server Apache, Java

Application integration

Fujitsu uses its state-of-the-art middleware offering "openSEAS" to address IT Integration options - from individual software to the provision of web services for the installation of company portals.

- openSEAS WebTransactions for the flexible integration of existing host applications
- openSEAS BeanConnect for the standardized connection of existing systems with application server applications
- Web services for openUTM
- BizXML2Cobol to implement business processes with recourse to services in existing applications
- Business transformation: comprehensive openSEAS and Oracle service portfolio

FACOM 100 – First mainframe from Fujitsu Japan

First delivery of the BS2000 operating system

First multiprocessor support

C30/C40 – First BS2000 mainframes on CMOS basis

Virtual machine system VM2000

Fujitsu mainframe milestones:
Success story of more than 50 years

1954

1975

1979

1988

1990

Experienced – flexible – competent

Your expert partner for all server topics

Fujitsu's expertise in the mainframe environment is based on decades of experience and long-term relationships with partners and customers. Fujitsu advises and operates as an experienced partner in the mainframe environment in a very competent way in all areas of IT infrastructures.

Dynamic Infrastructures		
Managed Infrastructure	Managed Data Center BS2000 Remote and local services (system administration, consulting services) financial service (AIP, CoD)	
Infrastructure as a Service	BS2000 Infrastructure as a Service Fujitsu provides BS2000 IT infrastructures and staff (productive, information and archive systems and disaster recovery)	
Infrastructure Solutions	BS2000 Solutions (DB offload, SOA integration, consult/design/build services, training, etc.)	
Infrastructure Products & Services	BS2000 HW-/SW-/MW-Portfolio (S/SQ Business Server and SE-Server, BS2000, BS2000 OSD/XC, openSEAS)	Maintenance and Support Services (remote/local, SLAs, etc.)

Human centric innovations for a business world that is full of tomorrow's dynamism

Dynamic times call for dynamic solutions – in the form of flexible and efficient infrastructures, easy-to-adapt business processes and intelligent methods of managing constantly increasing torrents of data. To also remain a competent partner in the future the thinking and actions of Fujitsu are determined by the focus on limited natural resources.

With clear environmental goals for all business activities, Fujitsu offers a complete range of environmentally conscious products and uses environmentally friendly technologies and processes throughout the entire product lifecycle.



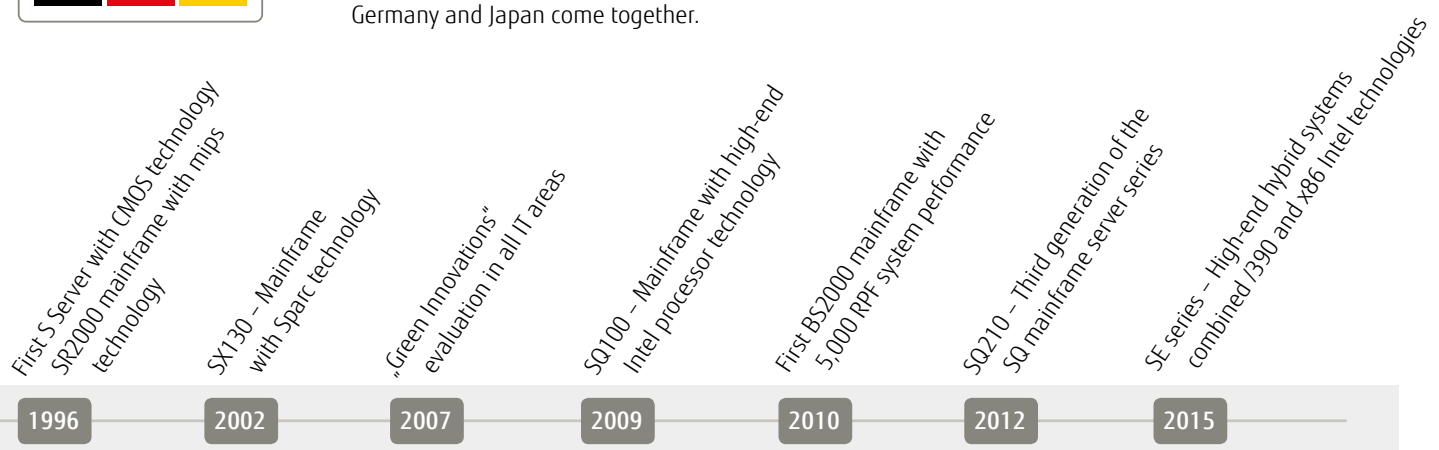
Fujitsu is a member of the "Green Grid, a consortium of IT companies and professionals whose aim is to reduce the overall consumption of power in data centers around the globe. Fujitsu is also a member of the Climate Savers Computing Initiative.



The Fujitsu Group is a member of the network "United Nations Global Compact". By upholding the Global Compact's ten principles in the areas of human rights, labor, environment and anti-corruption, as well as actively implementing corporate social responsibility (CSR) initiatives, Fujitsu promotes responsible management as a global company while contributing to the building of a sustainable society.



The facilities in Augsburg are one of the world's state-of-the-art production sites for computer and storage systems and the only remaining PC manufacturer in Germany with research and development departments as well as laboratories in which IT systems and individual components are developed and tested. This is where top-class engineering achievements and the highest quality requirements from Germany and Japan come together.



www.fujitsu.com/fts/bs2000



A clear view of everything at the click of a button: BS2000 Servers

Do you want to learn more new and useful facts concerning BS2000? Visit our web site and delve deeper into the variety of information and media that we have prepared for you on different topics:

www.fujitsu.com/fts/products/computing/servers/bs2000/business/

On the trail of optimization potential: BS2000 Services

Take a look at our current services for BS2000 and move your mouse over a detailed description of our service portfolio - from Managed Data Centers and BS2000 as a Service through to Maintenance and Support:

www.fujitsu.com/fts/products/computing/servers/bs2000/services

From experts for experts: BS2000 Training Courses

Are you familiar with our education and training offering for customers and partners? Learn about and decide in favor of training courses from experts for experts. We would also be happy to offer you in-house and individually tailored courses.

<https://training-public.ts.fujitsu.com/de/bs2000-osd.html>

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