Efficient and economic IT in the data center

High-End S175 and S210 Business Servers
BS2000/OSD Business Server

Current Portfolio

- **S175**
  - 170 up to 1040 RPF

- **S210**
  - 990 up to 5000 RPF

- **SQ210**
  - 12 up to 1750 RPF

Performance range 1 : 417 or 12 - 5000 RPF
The highlights of the new servers

- New processor based on 65nm technology
- Higher CPU and system performance
- Low-priced model entry-level and high degree of system flexibility
- Guaranteed high service levels
- Improved global storage performance and system capacity
- Support for twice the number of peripheral devices
- Low energy costs and a high degree of environmental compatibility
The challenges for mainframes

<table>
<thead>
<tr>
<th>High availability</th>
<th>Scaling</th>
<th>Total cost of ownership TCO</th>
<th>Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard hot spare CPU</td>
<td>Flexible provision of resources</td>
<td>Simple integration in existing infrastructures</td>
<td>High CPU performance (mono, multi-/multicore)</td>
</tr>
<tr>
<td>Redundant SKP</td>
<td>Performance, HSP and I/O interfaces</td>
<td>Standard SAN connectivity</td>
<td>Fibre Channel for storage and high-speed networking</td>
</tr>
<tr>
<td>Dual Power Feed</td>
<td>Use of capacity on demand</td>
<td>Full automation of daily IT operation</td>
<td>Global storage</td>
</tr>
<tr>
<td>Emergency or backup concept (COD)</td>
<td>Virtualization with the VM2000 concept</td>
<td>High efficiency levels with a large number of users</td>
<td>High I/O throughput via parallelism</td>
</tr>
<tr>
<td>High component availability</td>
<td></td>
<td>Low energy costs per system / user ....</td>
<td>COD: Management changing workloads and “peaks” ....</td>
</tr>
</tbody>
</table>
/390 Mainframe – Innovations S series

2,8

Performance (mono processor)

2,5

1,7

1,6

1,0

S170

180nm CMOS
46 million transistors
2nd level cache 2 MB

S180

130nm CMOS
190 million transistors
2nd level cache 2 MB

S190

90nm CMOS
500 million transistors
2nd level cache 6 MB

S200

65nm CMOS
Quad-Core CPU chip
2nd level cache 6 MB

S210

Performance (mono processor)
S server innovation

<table>
<thead>
<tr>
<th>Model</th>
<th>Performance Range</th>
<th>Technology</th>
<th>CPU's</th>
<th>IOP's</th>
</tr>
</thead>
<tbody>
<tr>
<td>S200</td>
<td>860 – 4300 RPF</td>
<td>90nm</td>
<td>15</td>
<td>4</td>
</tr>
<tr>
<td>S165</td>
<td>160 – 910 RPF</td>
<td>90nm</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>S175</td>
<td>170 – 1040 RPF</td>
<td>65nm</td>
<td>15</td>
<td>8</td>
</tr>
<tr>
<td>S210</td>
<td>990 – 5000 RPF</td>
<td>65nm</td>
<td>15</td>
<td>8</td>
</tr>
</tbody>
</table>

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The processor - the newly developed "heart" of the S175 and S210
- Current CMOS technology with 65 nm feature size
- 4 CPU cores per processor chip
- Increased performance of the individual CPU cores
- Short communication paths and shared L2 cache

The system board
- One board for S175, 2 or 4 boards for S210
- All processor chips on the first board, each S175 contains one processor chip, S210 contains up to 4 processor chips
- Contains memory, system controllers and ports for Global Store and IO processors
Current S server line

Business Servers S175

- Systems with 1 - 3 CPUs
- System performance of 170 RPF to 1040 RPF (Mono processor 390 RPF)
- Increase in max. system performance
  - about 15% in contrast to S165
  - about 25% in contrast to S155

Business Servers S210

- Systems with 2 - 15 CPUs
- System performance of 990 RPF to 5000 RPF (Mono processor 520 RPF)
- Clear increase in performance
  - about 15 - 20% in contrast to S200
  - about 65% in contrast to S190

- Each model is equipped with an additional hot spare CPU
- Guaranteed high service levels: many performance extensions can be made when the system is running or in worst case with only minor interruption
Business Server S175

Highlights

- 1 to 3 CMOS /390 processors and 1 hot spare CPU
- Performance range: 170 to 1040 RPF
- Mono processor performance: 390 RPF
- Up to 64 Gbyte main memory
- Up to 2 x 64 Gbyte global storage
- Up to 2 IOPs
- Max. 128 channels type S, max. 16 channels type FC, max. 60 channels type 2
- Operating system BS2000/OSD as of version 7.0
- Optional up to 15 guest systems with VM2000 V9.0
- Open Fibre Channel technology
- About 20% lower energy costs* and high-level environmental compatibility

Full flexibility with scaling, performance, availability and connectivity

* in contrast to previous system
Each model is upgradeability to
- max. 1040 RPF
- max. 64 Gbyte main memory
- max. 16x type FC, 128x type S, 64x type 2
Business Server S210

Highlights

- 2 to 15 CMOS-/390 processors and 1 hot spare CPU
- Model offer to meet requirements: 2, 3, 4, 6, 8, 10, 12, 14, 15 way system
- Performance range: 990 to 5000 RPF
- Up to 256 Gbyte main memory; 2 x 128 Gbyte global storage
- Up to 8 IOPs, max. 256 channels type S, max. 64 channels type FC, max. 60 channels type 2
- Operating system BS2000/OSD as of version 7.0
- Optional up to 15 guest systems with VM2000 V9.0
- Open Fibre Channel technology
- Pre-upgrade options
- About 20% lower energy costs* and high-level economic compatibility

* in contrast to previous system

Leader in performance, calling, availability and connectivity
Business Server S210 - Structure

<table>
<thead>
<tr>
<th>Model</th>
<th>No of CPU’s</th>
<th>Performance factor</th>
<th>RPF</th>
</tr>
</thead>
<tbody>
<tr>
<td>S210-20</td>
<td>2</td>
<td>1</td>
<td>990</td>
</tr>
<tr>
<td>S210-30</td>
<td>3</td>
<td>1.4</td>
<td>1390</td>
</tr>
<tr>
<td>S210-40</td>
<td>4</td>
<td>1.8</td>
<td>1770</td>
</tr>
<tr>
<td>S210-50</td>
<td>5</td>
<td>2.2</td>
<td>2130</td>
</tr>
<tr>
<td>S210-60</td>
<td>6</td>
<td>2.5</td>
<td>2480</td>
</tr>
<tr>
<td>S210-80</td>
<td>8</td>
<td>3.2</td>
<td>3150</td>
</tr>
<tr>
<td>S210-100</td>
<td>10</td>
<td>3.8</td>
<td>3750</td>
</tr>
<tr>
<td>S210-120</td>
<td>12</td>
<td>4.3</td>
<td>4300</td>
</tr>
<tr>
<td>S210-140</td>
<td>14</td>
<td>4.8</td>
<td>4750</td>
</tr>
<tr>
<td>S210-150</td>
<td>15</td>
<td>5.1</td>
<td>5000</td>
</tr>
</tbody>
</table>
Two or four system boards in S210

System Control
Data Path Unit

Main Memory

General Processors
(Quad-Core)

System Control
X-Bar Units

Main Memory

General Processors
(Quad-Core)

DC - DC Converter

System board S175
The performance option for S175 and S210 server

- Throughput and capacity increase with global storage
  - Memory up to 2 x 128 GB per S210 (double compared to S200)
  - Data rate up to 2 GB/s

- Fast downtime system-specific cache
  - Use as redundant GSP with battery and HW duplications
  - Clustering and failover
  - Power failure bridging with at least 24h battery operation

- To meet high demands regarding data availability
Extended peripherals for S210 / S175

- New peripheral devices for BS2000 Servers
  - ETERNUS DX400 S2 / DX8700 S2
  - Symmetrix V-Max
  - ETERNUS CS High End (and Net-Storage from BS2000/OSD V9.0)
  - Scalar 10K, i2000/i6000 and i500 with LTO5 from BS2000/OSD-BC V8.0 (LTO6 planned in 2013)

- Support for open fibre channel interfaces standards (such as UNIX systems, Win,..)

- Standardized infrastructure for BS2000/OSD and Open Systems
ETERNUS DX400 S2 / DX8700 S2

Qualified for BS2000/OSD: S- and SX/SQ-Server

High-End storage DX8700 S2

Midrange storage DX410 S2 / DX440 S2

New
ETERNUS DX410 S2, DX440 S2 and
ETERNUS DX8700 S2 with SHC-OSD 10.0

Approved for BS2000/OSD:
- S-Server from OSD V7.0
- SQ-Server from OSD V8.0
- SX-Server from OSD V8.0
- SHC-OSD V10.0

Scalable Capacity and Performance

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BS2000/OUD Online / Nearline Peripherals

Quantum Scalar
LTO

S series

ETERNUS DX series
DX400 S2
DX8700 S2

Fibre Channel

ETERNUS CS High End

Fibre Channel

ETERNUS LT40
LTO

Nearline

SQ series

EMC Symmetrix
DMX / VMAX

ETERNUS CS High End
(Net-Storage as of OSD V9.0)

LAN

HNC

ETERNUS CS High End

FC

SAS

RAID disk subsystem
ETERNUS JX40

Online
Advantages for growth customers:

- CPU performance reserves for peak requirements
- Four different usage periods: 30, 60, 90 or 120 days
- The customer defines the start and end of usage
The excellent TCO of the mainframes has been proven again:

- Distributed platforms are double the cost of the mainframe – per unit or per user

Source: Mainframe Market Bulletin, Arcati Ltd January 2011

... BS2000/OSD helps to reduce costs for those elements which represent an ever-increasing share of the total costs in the data center

... BS2000/OSD is and remains efficient even with high load peaks and an extremely high number of users

Mainframes provide the best TCO all platforms

![Figure 3: Relative cost per user](image)

**Figure 2: Basic platform costs - per unit of work or per user/application**

* Source: Arcati Ltd; A fresh look at The Dynosour Myth
Takes care of environment and budget

- High degree of energy efficiency
  - Approx. 20% less energy consumption *
  - System performance is simultaneously up to 20% greater *
  - Clearly reduced energy costs for servers and cooling

- Environmentally friendly
  - The greatly reduced energy consumption for the new servers helps to protect the environment and the climate
  - The new powder coating means that the housing paint has no volatile organic connections

- Low footprint for mainframes
  - Minimum space requirements, yet top performance and functionality

* in contrast to previous system
High-speed Net Connect HNC-VI

New HNC-VI 91855

- **Hardware-based PRIMERGY RX350-S7 / TX300-S7**
  - Floor-stand and rack
  - Incl. 2x Fibre Channel and 2x LAN
  - Basic configuration equipped ready for operation

- **Server port**
  - Only Fibre Channel (FC)
  - Connection to S series: direct or via FC switch

- **High Availability**
  - Basic configuration with mirrored boot disk
  - Second Power supply is provided as standard
  - Automatic password protection, fast restoration of user profiles

- **Throughput:**
  - Up to 90,000 transactions /sec and
  - Up to 115 Mbyte /sec

![Graph showing throughput and transaction factor comparison between openNet Server versions](https://www.fujitsu.com/solutions/cloud-computing/ham/)
BS2000/Osd software roadmap

Software innovations with BS2000/OSD

OSD V8.0
- Intel server support
- FibreCAT integration
- Remote service
- New SWK versions
- Extended SOA support

OSD V9.0
- Extensions SQ Server SQ210
- Net-Storage integration
- Extensions with ease-of-use, Performance, automation
- SHC-OSD: Clone and snap function ETERNUS DX
- SESAM: dynamism, SOA

OSD V10.0
- Support new server generation incl. HA & LM
- Net-storage interoperability
- Measures to increase performance
- openSM2: web-based interface
- SHC-OSD: asynchronous REC for ETERNUS DX
- SESAM: stored procedures ; Oracle: 12c migration
- Further development of the software configuration
Business Server S175 and S210 - summary

- High reliability and availability levels for all business data and processes
- Investment protection via long-term compatible support of customer applications
- Perfect integration for existing applications in web-capable systems
- Increased system performance and maximum scaling
- Capacity on demand to cover peak loads
- Lower TCO thanks to sophisticated automation technology
- Low energy costs per system/user
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