FUJITSU

PRIMERGY BX920 S4

System configurator and order-information guide

Contents

Instructions
Configuration diagram
Configurator

Change report

PRIMERGY Server

Instructions

This document contains basic product and configuration information that will enable you to configure your system via System-Architect.

Only the tool "System-Arcitect" will ensure a fast and proper configuration of your PRIMERGY server or your complete PRIMERGY Rack system.
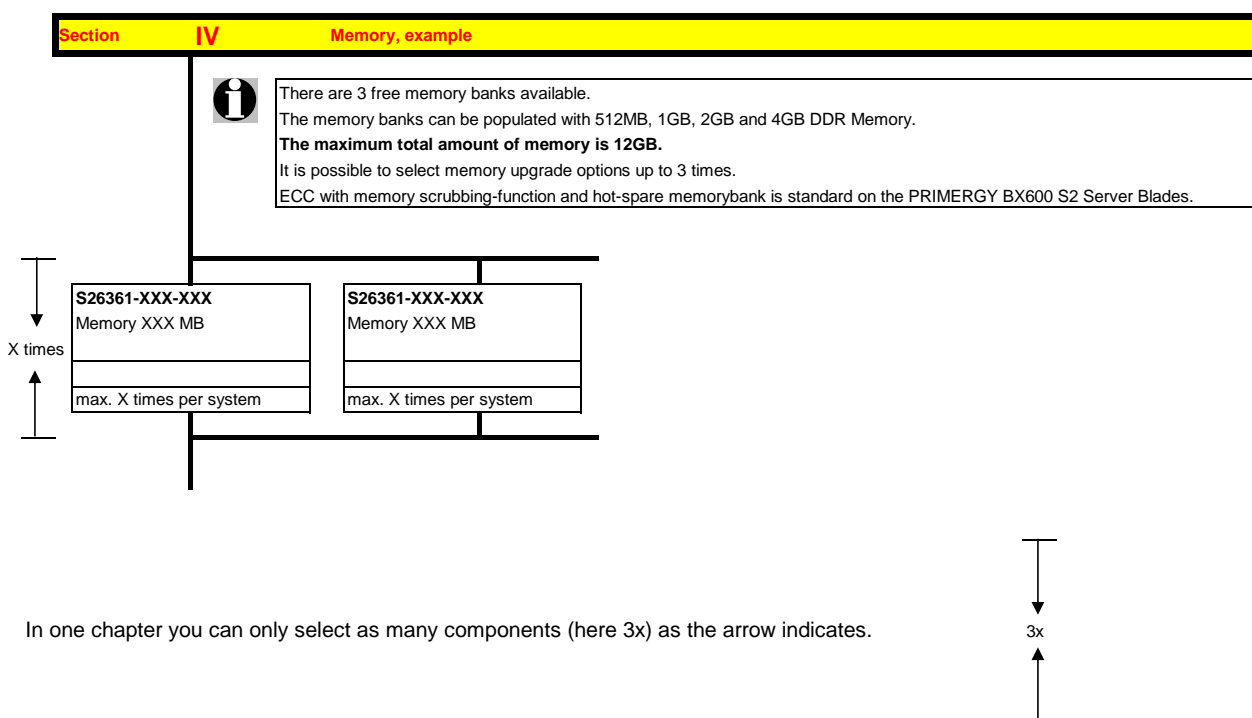
Please pay attention to the naming conventions: **BX900 S1**   System unit 1nd generation
                                                              BX920 S2   Dual Server Blade S2

You can configure your individual PRIMERGY server in order to adjust your specific requirements.

The System configurator is divided into several chapters that are identical to the current price list and PC-/ System-Architect.

Please follow the lines. If there is a junction, you can choose which way or component you would like to take. Go through the configurator by following the lines from the top to the bottom.

Section	IV	Memory, example

There are 3 free memory banks available.
The memory banks can be populated with 512MB, 1GB, 2GB and 4GB DDR Memory.
The maximum total amount of memory is 12GB.
It is possible to select memory upgrade options up to 3 times.
ECC with memory scrubbing-function and hot-spare memorybank is standard on the PRIMERGY BX600 S2 Server Blades.

X times

S26361-XXX-XXX	**S26361-XXX-XXX**
Memory XXX MB	Memory XXX MB
max. X times per system	max. X times per system

In one chapter you can only select as many components (here 3x) as the arrow indicates.

3x

Please note that there are information symbols which indicate necessary information.
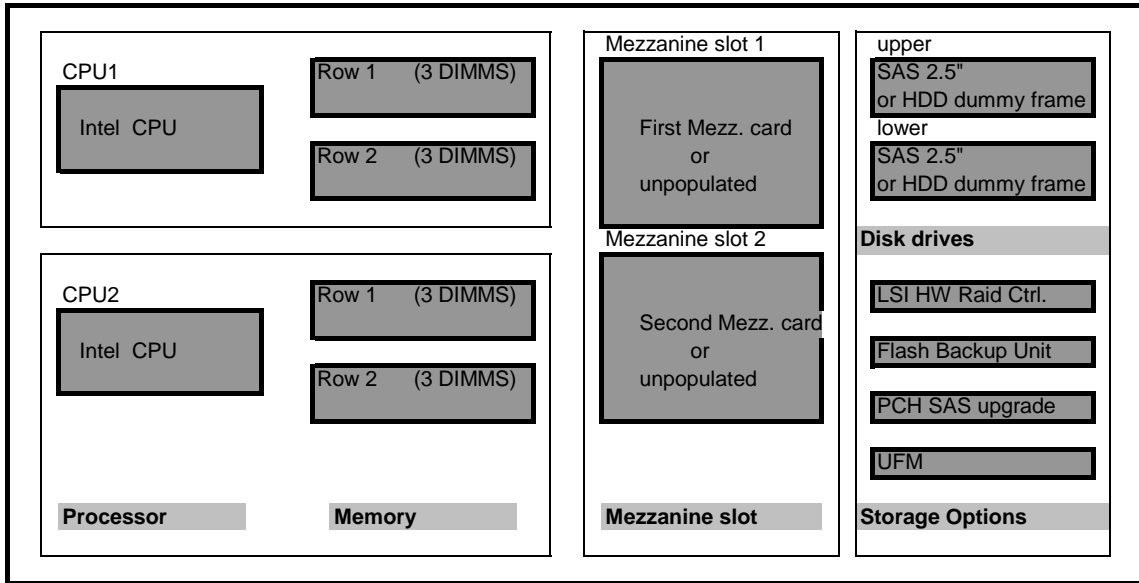
For further information see:

http://ts.fujitsu.com/products/standard_servers/index.html   (internet)

https://partners.ts.fujitsu.com/com/order-supply/configurators/primergy_config/Pages/Currentconfigurators.aspx   (extranet)

Prices and availability see price list and PC-/ System-Architect
Subject to change and errors excepted

Configuration diagram Dual Server Blade BX920 S4

| CPU1 | Row 1 (3 DIMMS) |
| Intel CPU | Row 2 (3 DIMMS) |

| CPU2 | Row 1 (3 DIMMS) |
| Intel CPU | Row 2 (3 DIMMS) |

Processor   **Memory**

Mezzanine slot 1

First Mezz. card
or
unpopulated

Mezzanine slot 2

Second Mezz. card
or
unpopulated

Mezzanine slot

upper
SAS 2.5"
or HDD dummy frame
lower
SAS 2.5"
or HDD dummy frame

Disk drives

LSI HW Raid Ctrl.

Flash Backup Unit

PCH SAS upgrade

UFM

Storage Options

Key:

Included in basic unit   Option

The population order for the CPU is: CPU1 first, then CPU2

The population order for the DIMMs: for each CPU, the DIMM row 1 (DIMMS 1A 1B 1C) (DIMMS 1D 1E 1F) first, then row 2 (DIMMs 2A, 2B, 2C) (DIMMs 2D, 2E, 2F)

D

Section	X	Dual Socket Server Blade BX920 S4

i | Server Blade with:
- Dual INTEL Romley Processor Support as Dual/Quad/Six-Core
- The base units with INTEL Processor
- 12 DIMM sockets, organized in 2 row (6 DIMM) for CPU1 and 2 row (6 DIMM) for CPU2
- 1x Dual channel 10 Gbit Ethernet CNA controller on-board
- Hard disk controller for the 2x SAS/SATA HDD/SSD
- 2 bays for 2.5" SAS hard disks (hot-plug)
- iRMC S4 on-board
- Special connector for Y-cable (2x USB, 1x serial, 1x VGA).

i | **Due to BE3 patent infrigement delivery of S26361-K1450-V*** into**
United States of America market is restricted.

i | **The BX920 S4 Server Blade can be installed max. 18x in the BX900 System Unit**
The BX920 S4 Server Blade can be installed max. 8x in the BX400 System Unit

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S26361-K1450-V100

PY BX920 S4 Dual Server Blade
up to 2x 2.5" SAS/SATA hard disk drives.
Dual Server Blade Base Unit without
CPU and without memory modules!
PY BX920 S4 Dual Server Blade
For CPU and Memory configuration see section XLI.
Max. 18x per BX900 System Unit.
Max. 8x per BX400 System Unit.

S26361-F4478-L2
PY BX900 Y-Cable frontside
for KVM connection to
Server Blade
2x USB, 1x VGA

S26361-F3552-E1

TPM Module
Trusted Platform Module on motherboard
PY TPM Module
Be aware of import restrictions!
Max. 1x per Server Blade.

Following USB Components are available	
1) USB DVD SM / Blu-Ray	
External SuperMulti Drive (as soon as available)	S26341-F103-L119
External Blu-Ray Drive (as soon as available)	S26341-F103-L120
2) USB Keyboard:	S26381-K340-V120
KBPC PX D, professional keyboard	
3) USB Mouse:	S26381-K415-L100
Optical Wheel Mouse Tilt USB/PS2	
4) USB Memorybird:	
MyUSBS A910 8GB, MLC Flash	S26391-F6048-L208
MyUSBS A910 16GB, MLC Flash	S26391-F6048-L216

S26361-F2749-E1

Service for Server Blade installation in the System Unit.
Hereby the BX900 S1 will be delivered completely
configured and tested with Server Blades integrated.
This order number must be in the same order as the System Unit itself.
min. 1x per System Unit; max. 18x per System Unit; max. 1x per Server Blade

S26361-F2749-E2

Server Blade individually packed / delivered.
The Server Blade is not built in a BX900 S1,
it is separately tested and delivered.
Contains ServerStart CD
max. 1x per Server Blade

E

E

> There are 2 processor sockets available.
> The first socket is always equipped with the **first CPU** which can be selected via configurator
> It is also possible to upgrade a dual-processor system later on with a **second CPU**
> For the second CPU there are different order numbers, due to the different Heatsink.
> **Two processors with different clock frequencies are not possible**
> A multi-processor operating system is required for a dual-processor system.

Max. two CPU`s can be selected per basic unit

One of following CPU´s has to be selected as first CPU

for an orderable basic unit

Optional second CPU has to be the same type like the first CPU

Basic 4C CPU's
- 1x 64-bit Intel Xeon (10MB shared TLC = Third Level Cache)
  1066 MHz DDR3 Bus, 6,40 GT/s QPI Bus and passive heat sink
  occupies socket for one CPU

| Xeon E5-2403 v2 4C/4T 1.80GHz 10MB 6.40GT/s 1333MHz 80W | S26361-F5290-E180 |
| Xeon E5-2407 v2 4C/4T 2.40GHz 10MB 6.40GT/s 1333MHz 80W | S26361-F5290-E240 |

Standard Turbo 6C CPU's
- 1x 64-bit Intel Xeon (15/20MB shared TLC = Third Level Cache); Hyper-Threading (HT);
  1333 MHz DDR3 Bus, 7,20 GT/s QPI Bus and passive heat sink
  occupies socket for one CPU

Xeon E5-2420 v2 6C/12T 2.20GHz 15MB 7.20GT/s 1600MHz 80W	S26361-F5290-E220
Xeon E5-2430 v2 6C/12T 2.50GHz 15MB 7.20GT/s 1600MHz 80W	S26361-F5290-E250
Xeon E5-2440 v2 8C/16T 1.90GHz 20MB 7.20GT/s 1600MHz 95W	S26361-F5290-E190

Advanced Turbo+ 8C CPU`s
- 1x 64-bit Intel Xeon (20MB shared TLC = Third Level Cache); Hyper-Threading (HT);
  1600 MHz DDR3 Bus, 8,00 GT/s QPI Bus and passive heat sink
  occupies socket for one CPU

| Xeon E5-2450 v2 8C/16T 2.50GHz 20MB 8.00GT/s 1600MHz 95W | S26361-F5290-E251 |
| Xeon E5-2470 v2 10C/20T 2.40GHz 25MB 8.00GT/s 1600MHz 95W | S26361-F5290-E241 |

Low Power 6C/8C CPU's
- 1x 64-bit Intel Xeon (15/25MB shared TLC = Third Level Cache); Hyper-Threading (HT);
  1333/1600 MHz DDR3 Bus, 7,2/8,00 GT/s QPI Bus and passive heat sink
  occupies socket for one CPU

| Xeon E5-2430L v2 6C/12T 2.40GHz 15MB 7.20GT/s 1600MHz 60W | S26361-F5290-E242 |
| Xeon E5-2450L v2 10C/20T 1.70GHz 25MB 8.00GT/s 1600MHz 60W | S26361-F5290-E170 |

1x

Max. two CPU`s can be selected per basic unit

One of following CPU´s has to be selected as second CPU

for an orderable basic unit

Optional second CPU has to be the same type like the first CPU

Basic 4C CPU's
- 1x 64-bit Intel Xeon (10MB shared TLC = Third Level Cache)
  1066 MHz DDR3 Bus, 6,40 GT/s QPI Bus and passive heat sink
  occupies socket for one CPU

| Xeon E5-2403 v2 4C/4T 1.80GHz 10MB 6.40GT/s 1333MHz 80W | S26361-F5291-E180 |
| Xeon E5-2407 v2 4C/4T 2.40GHz 10MB 6.40GT/s 1333MHz 80W | S26361-F5291-E240 |

Standard Turbo 6C CPU's
- 1x 64-bit Intel Xeon (15/20MB shared TLC = Third Level Cache); Hyper-Threading (HT);
  1333 MHz DDR3 Bus, 7,20 GT/s QPI Bus and passive heat sink
  occupies socket for one CPU

Xeon E5-2420 v2 6C/12T 2.20GHz 15MB 7.20GT/s 1600MHz 80W	S26361-F5291-E220
Xeon E5-2430 v2 6C/12T 2.50GHz 15MB 7.20GT/s 1600MHz 80W	S26361-F5291-E250
Xeon E5-2440 v2 8C/16T 1.90GHz 20MB 7.20GT/s 1600MHz 95W	S26361-F5291-E190

Advanced Turbo+ 8C CPU`s
- 1x 64-bit Intel Xeon (20MB shared TLC = Third Level Cache); Hyper-Threading (HT);
  1600 MHz DDR3 Bus, 8,00 GT/s QPI Bus and passive heat sink
  occupies socket for one CPU

| Xeon E5-2450 v2 8C/16T 2.50GHz 20MB 8.00GT/s 1600MHz 95W | S26361-F5291-E251 |
| Xeon E5-2470 v2 10C/20T 2.40GHz 25MB 8.00GT/s 1600MHz 95W | S26361-F5291-E241 |

Low Power 6C/8C CPU's
- 1x 64-bit Intel Xeon (15/25MB shared TLC = Third Level Cache); Hyper-Threading (HT);
  1333/1600 MHz DDR3 Bus, 7,2/8,00 GT/s QPI Bus and passive heat sink
  occupies socket for one CPU

| Xeon E5-2430L v2 6C/12T 2.40GHz 15MB 7.20GT/s 1600MHz 60W | S26361-F5291-E242 |
| Xeon E5-2450L v2 10C/20T 1.70GHz 25MB 8.00GT/s 1600MHz 60W | S26361-F5291-E170 |

1x

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Section	XII	Storage

Mixed configurations with ECO SATA drives and SAS drives are not allowed

Configurations with Eco SATA can only be mixed with BC SATA HDD type

All combinations of SSD, BC SATA and SAS are possible - but not in same logical drive (RAID array)

Both hard disks are plugged in directly connected to the onboard controller.

One UFM can be configured in addition to the Hard Disks

Remark: UFM is part of the VMWare Embedded solution (S26361-F2341-E431)

SAS Drives require the SAS Option to enable PCH SAS connection

or the SAS RAID Option

Solid State Disk, Mainstream Endurance*

SSD SATA 6Gb/s 2.5" with hot plug/hot replace tray (H-P)	
100GB, Mainstream Performance	S26361-F5303-E100
200GB, Mainstream Performance	S26361-F5303-E200
400GB, Mainstream Performance	S26361-F5303-E400
800GB, Mainstream Performance	S26361-F5303-E800

SSD SAS 12Gb/s 2.5" with hot plug/hot replace tray (H-P)	
200GB, Enterprise Performance	S26361-F5297-E200
400GB, Enterprise Performance	S26361-F5297-E400
800GB, Enterprise Performance	S26361-F5297-E800
1.6TB, Enterprise Performance	S26361-F5297-E160
max. 2x per system	

as soon as available

Interface SAS12Gb/s and SAS 6Gb/s.

SAS 12Gb/s support is not released

*) SSD Mainstream Endurance 10DWPD over 5y

max 2x

SAS Disk Drive 2.5"

HDD SAS 6Gb/s 2.5" with hot plug/hot replace tray	
300GB 10000rpm,<4,5ms, 8MB Cache, 512n	S26361-F5247-E130
450GB 10000rpm,<4,5ms, 8MB Cache, 512n	S26361-F5247-E145
600GB 10000rpm,<4,5ms, 8MB Cache, 512n	S26361-F5247-E160
900GB 10000rpm,<4,5ms, 8MB Cache, 512n	S26361-F5247-E190
1,2TB 10000rpm,<4,5ms, 8MB Cache, 512n	S26361-F5247-E112
146GB 15krpm,<4,5ms, 32MB Cache, 512n	S26361-F4482-E514
300GB 15krpm,<4,5ms, 32MB Cache, 512n	S26361-F4482-E530
450GB 15krpm,<4,5ms, 32MB Cache, 512n	S26361-F4482-E545
600GB 15krpm,<4,5ms, 32MB Cache, 512n	S26361-F4482-E560
500GB 7.2krpm,<9,5ms, 64MB Cache, 512n	S26361-F5228-E500
1TB 7.2krpm,<9,5ms, 64MB Cache, 512n	S26361-F5228-E100

HDD SAS 12Gb/s 2.5" with hot plug/hot replace tray	
300GB 10000rpm, 128MB Cache, 512n	S26361-F5551-E130
600GB 10000rpm, 128MB Cache, 512n	S26361-F5551-E160
900GB 10000rpm, 128MB Cache, 512n	S26361-F5551-E190
1.2TB 10000rpm, 128MB Cache, 512n	S26361-F5551-E112
1.8TB 10000rpm, 128MB Cache, 512e	S26361-F5544-E118
max. 2x per system	

SATA Disk Drive 2.5"

HDD SATA 6Gb/s 2.5" with hot plug/hot replace tray	
250GB 7.2krpm,<9,5ms, 64MB Cache, 512n	S26361-F3708-E250
500GB 7.2krpm,<9,5ms, 64MB Cache, 512n	S26361-F3708-E500
1TB 7.2krpm,<9,5ms, 64MB Cache, 512n	S26361-F3708-E100
max. 2x per system	

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F1

Section   **XIII**   **RAID Functionality on Server Blade**

The Dual Server Blade supports different RAID soltutions for internal HDD's
1. PCH based RAID
2. PCH based RAID with SAS upgrade
3. SAS RAID HDD Module with LSI HW RAID w/o cache
4. SAS RAID HDD Module with LSI HW RAID w/ 512 MB Cache and optional FBU
Also the SAS BP has to be changed. It is included in the RAID Mezz HDD Connection Kit.

Configuration Hint - Second CPU needed for SAS RAID Modules
The SAS RAID Modules are only supported if the second CPU is installed

S26361-F3674-E1
Onboard Controller SAS upgrade
LSI
Patsburg B
RAID 0, 1 & 10
no controller cache
SAS 3Gb/sec
4 internal ports
PCIe x4
no PCI slot required
max. 1x per Server Blade

This upgrade is required to
add SAS support to the PCH controller

S26361-F4531-E513
PY SAS RAID HDD Module
w/ 512 MB Cache
MegaRAID
RAID level 0/1/1E/10/5/50/6/60
SAS 6Gb/sec
pluggable on the main board
PCIe Gen3 interface
4x SAS links to midplane
2x SAS links to internal HDD's
max. 1x per Server Blade

S26361-F4531-E300
PY SAS RAID HDD Module
w/o Cache
MegaRAID (iMR)
RAID level 0/1/10
SAS 6Gb/sec
pluggable on the main board
PCIe Gen3 interface
4x SAS links to midplane
2x SAS links to internal HDD's
max. 1x per Server Blade

S26361-F4531-E10
RAID FBU Upgrade
Flash Backup Unit
max. 1x per Server Blade

1 x

The SAS Expander Mezz Card
must be used in order
to establish the connection
to the SAS CB with the
PY SAS RAID HDD Module
S26361-F4531-E513 or
PY SAS RAID HDD Module w/o cache
S26361-F4531-E300

S26361-F4531-E50
RAID HDD Module Connection Kit
2x SAS HDD BP
max. 1x per Server Blade

G

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Section   XIV   iRMC S4, Graphics

> **Graphic Controller is part of the onboard Management Controller iRMC S3.**
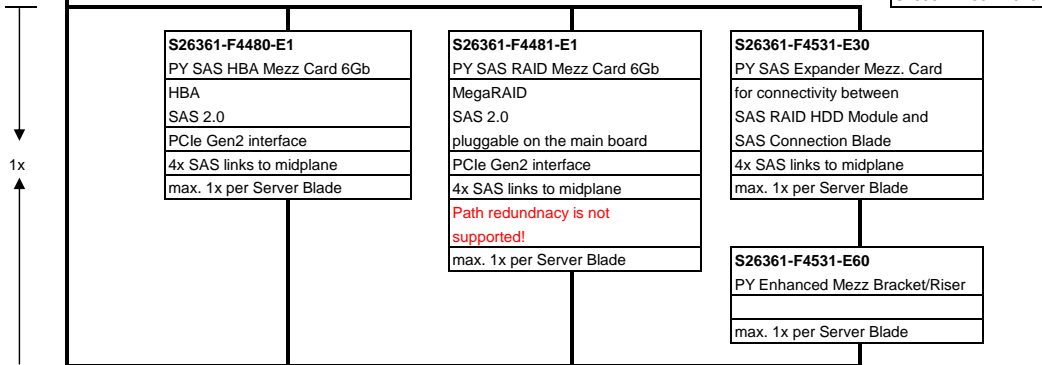> **Other graphics are not possible.**

> **The iRMC S4 advanced pack is included in the system delivery.**
> **A corresponding license order is not necessary.**

Section   XV   Mezzanine cards for Dual Socket Server Blade

> The Dual Server Blade supports the following optional mezzanine cards.
> A Fibre Channel Switch / Pass-Thru blade, an Ethernet LAN Switch / Pass-Thru blade,
> respectively an InfiniBand switch is required in the system unit for this functionality.

> SAS Mezz Cards require an SAS switch for each SAS link
> SAS Mezz Cards have to be installed in Mezz Card slot 2 on Server Blade

> SAS Expander Mezz Card
> can only be used with
> PY SAS RAID HDD Module
> S26361-F4531-E513

1x

S26361-F4480-E1
PY SAS HBA Mezz Card 6Gb
HBA
SAS 2.0
PCIe Gen2 interface
4x SAS links to midplane
max. 1x per Server Blade

S26361-F4481-E1
PY SAS RAID Mezz Card 6Gb
MegaRAID
SAS 2.0
pluggable on the main board
PCIe Gen2 interface
4x SAS links to midplane
Path redundnacy is not
supported!
max. 1x per Server Blade

S26361-F4531-E30
PY SAS Expander Mezz. Card
for connectivity between
SAS RAID HDD Module and
SAS Connection Blade
4x SAS links to midplane
max. 1x per Server Blade

S26361-F4531-E60
PY Enhanced Mezz Bracket/Riser

max. 1x per Server Blade

> Requires an Ethernet LAN
> Switch, IBP or Pass-Thru
> Blade for each channel.

> Requires a Fibre Channel
> Switch for each channel.

0 - 2x

S26361-F3331-E1
PY Eth Mezz Card 1Gb 4 Port
2x Intel Zoar controller
4x 10/100/1000 Mbit/s.
pluggable on the main board,
four channel 1Gbit/s
PCIe x4 Interface
max. 2x per Server Blade

S26361-F3874-E1
PY FC Mezz Card 8Gb 2 Port
Emulex LPe12002 compatible
pluggable on the main board,
MC-FC82E
Dual channel 8Gbit/s
PCIe x8 interface
max. 2x per Server Blade

S26361-F3997-E1
PY Eth Mezz Card 10Gb 2 Port
Intel 82599EB LAN Controller
2x 10Gbit/s.
pluggable on the main board,
Dual channel 10Gbit/s
PCIe x8 Interface
iSCSI Boot (planned)
max. 2x per Server Blade

as soon as available

S26361-F4994-E402
PY FC Mezz Card 16Gb 2 Port
Emulex LPe16002 compatible
pluggable on the main board,
MC-FC162E
Dual channel 16Gbit/s
PCIe x8 interface
max. 2x per Server Blade

S26361-F3592-E532
PY CNA Mezz Card 10Gb 2 Port
Emulex OCe11102 compatible
pluggable on the main board
MC-CNA112E
Dual channel 10Gbit/s
PCIe x8 Interface

max. 2x per Server Blade

R	S	T	U	V

> **R: see separate BX900 System Unit configurator, sheet "1 GB Ethernet"**
> **S: see separate BX900 System Unit configurator, sheet "10 GB Ethernet"**
> **T: see separate BX900 System Unit configurator, sheet "Fibre Channel"**
> **U: see separate BX900 System Unit configurator, sheet "InfiniBand"**
> **V: see separate BX900 System Unit configurator, sheet "CB SAS"**
> https://partners.ts.fujitsu.com/com/order-supply/configurators/primergy_config/current/Pages/default.aspx

| G |

- There are 6 memory slots per CPU for max.
   384GB LRDIMM (6x 64GB 8R)
   96GB RDIMM (6x 16GB 2R)
   48GB UDIMM (6x 8GB) on project release only
  => max. 768GB for two CPU`s (384GB per CPU), using LRDIMM
- The memory area is divided into 3 channels per CPU with 2 slots per channel
- Slot 1 of each channel belongs to memory bank 1, slot 2 belongs to memory bank 2,
  slot 3 belongs to memory bank 3

Registered and Load Reduced (LR) modules can be selected
No mix of registered and load reduced modules allowed.
  Memory can be operated at 1.5V or 1.35V, even if the modules are of low voltage type.
  Memory operating voltage can be set within BIOS (**1.5V is default** setting for max. speed).
  In a 2 RDIMMs per channel configuration, following frequencies are supported:
  - 1.5V - 1600MHz max (depending on CPU)
  - 1.35V - 1333MHz max (depending on CPU)
  SDDC (Chipkill) is supported for registered & load redueced x4 organized memory modules

1.) In the "Independent Channel Mode" is following configuration possible
  Channels can be populated in any order in Independent Channel Mode. All four
  channels may be populated in any order and have no matching requirements. All
  channels must run at the same interface frequency but individual channels may run at
  different DIMM timings (RAS latency, CAS latency, and so forth)
  No mix of registered, load reduced and unbuffered modules allowed.

2.) "Rank Sparing Mode" configuration
 - Within a memory channel, one rank is a spare of the other ranks.
  The Spare Rank is held in reserve and is not available as system memory
  For the effective memory capacity, please refer to the spreadsheet below.
  The BIOS is set to the rank sparing setting.
  Minimum configuration is: 2x 1R, 2x 2R or 1x4R DDR3 module per channel
  This mode is not supported by x8 organized memory modules

3.) "Performance Mode" configuration
 - In this configuration, the memory module population ex factory is spread across all channels.
  The BIOS is set to the max. performance for memory.
  Minimum configuration is: 3x identical modules

4.) In the "Mirrored Channel Mode" is following configuration possible
 - Each memory bank can optionally be equipped with 2x registered memory modules
  In each memory bank channel B and C of CPU 1 or channel E and F of CPU 2 have to be
  equipped with identical modules for mirrored channel mode.
  In channel C is always the mirrored memory of channel B of CPU 1
  In channel F is always the mirrored memory of channel E of CPU 2
  Minimum configuration is: 2x identical modules
  This mode is not supported by x8 organized memory modules

| G1 |

G1
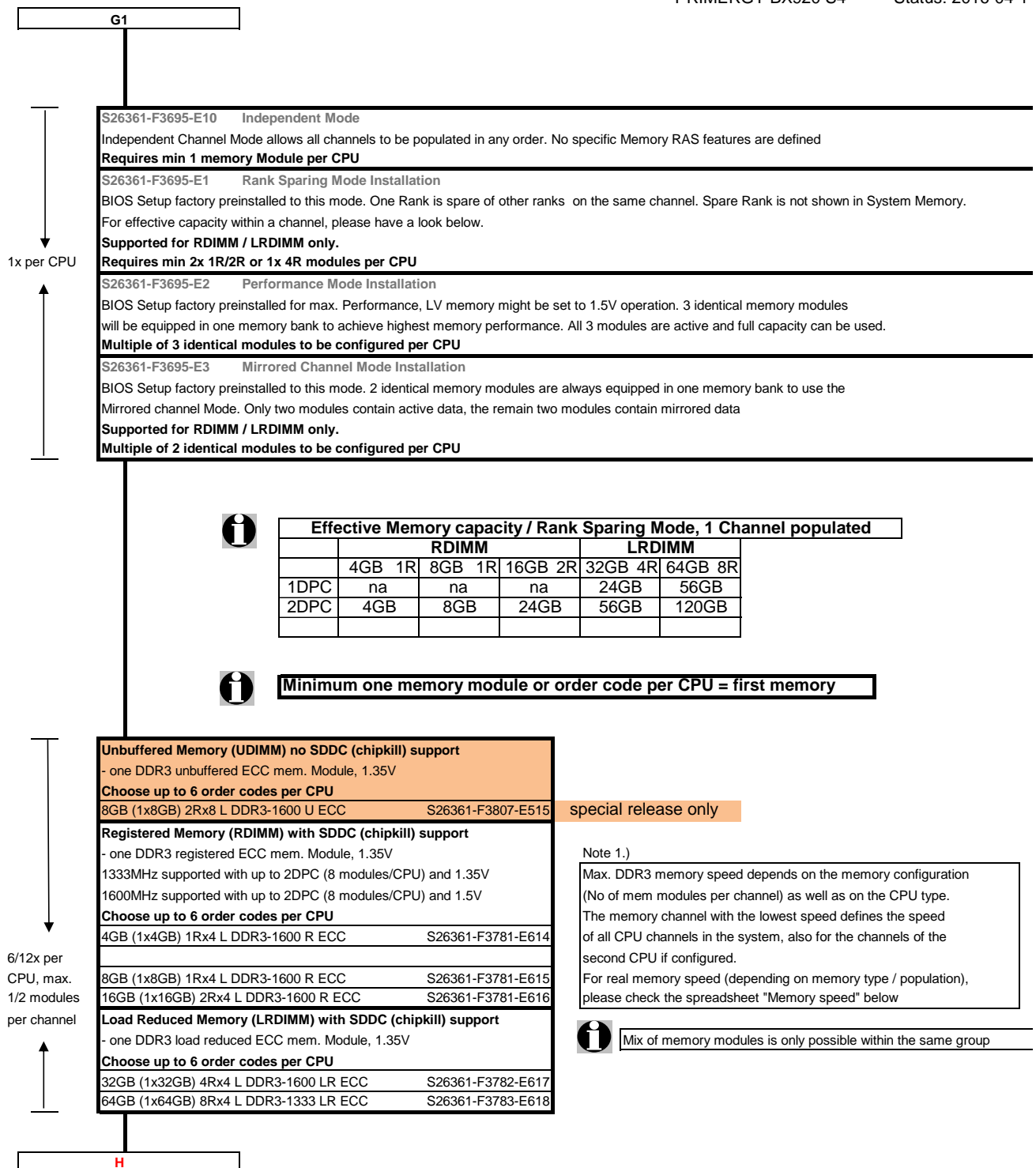
1x per CPU

S26361-F3695-E10	**Independent Mode**

Independent Channel Mode allows all channels to be populated in any order. No specific Memory RAS features are defined

Requires min 1 memory Module per CPU

S26361-F3695-E1	**Rank Sparing Mode Installation**

BIOS Setup factory preinstalled to this mode. One Rank is spare of other ranks on the same channel. Spare Rank is not shown in System Memory.

For effective capacity within a channel, please have a look below.

Supported for RDIMM / LRDIMM only.

Requires min 2x 1R/2R or 1x 4R modules per CPU

S26361-F3695-E2	**Performance Mode Installation**

BIOS Setup factory preinstalled for max. Performance, LV memory might be set to 1.5V operation. 3 identical memory modules

will be equipped in one memory bank to achieve highest memory performance. All 3 modules are active and full capacity can be used.

Multiple of 3 identical modules to be configured per CPU

S26361-F3695-E3	**Mirrored Channel Mode Installation**

BIOS Setup factory preinstalled to this mode. 2 identical memory modules are always equipped in one memory bank to use the

Mirrored channel Mode. Only two modules contain active data, the remain two modules contain mirrored data

Supported for RDIMM / LRDIMM only.

Multiple of 2 identical modules to be configured per CPU

Effective Memory capacity / Rank Sparing Mode, 1 Channel populated

	RDIMM			LRDIMM	
	4GB 1R	8GB 1R	16GB 2R	32GB 4R	64GB 8R
1DPC	na	na	na	24GB	56GB
2DPC	4GB	8GB	24GB	56GB	120GB

Minimum one memory module or order code per CPU = first memory

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6/12x per CPU, max. 1/2 modules per channel

Unbuffered Memory (UDIMM) no SDDC (chipkill) support
- one DDR3 unbuffered ECC mem. Module, 1.35V
Choose up to 6 order codes per CPU

8GB (1x8GB) 2Rx8 L DDR3-1600 U ECC	S26361-F3807-E515	special release only

Registered Memory (RDIMM) with SDDC (chipkill) support
- one DDR3 registered ECC mem. Module, 1.35V
1333MHz supported with up to 2DPC (8 modules/CPU) and 1.35V
1600MHz supported with up to 2DPC (8 modules/CPU) and 1.5V
Choose up to 6 order codes per CPU

4GB (1x4GB) 1Rx4 L DDR3-1600 R ECC	S26361-F3781-E614
8GB (1x8GB) 1Rx4 L DDR3-1600 R ECC	S26361-F3781-E615
16GB (1x16GB) 2Rx4 L DDR3-1600 R ECC	S26361-F3781-E616

Load Reduced Memory (LRDIMM) with SDDC (chipkill) support
- one DDR3 load reduced ECC mem. Module, 1.35V
Choose up to 6 order codes per CPU

32GB (1x32GB) 4Rx4 L DDR3-1600 LR ECC	S26361-F3782-E617
64GB (1x64GB) 8Rx4 L DDR3-1333 LR ECC	S26361-F3783-E618

Note 1.)

Max. DDR3 memory speed depends on the memory configuration
(No of mem modules per channel) as well as on the CPU type.
The memory channel with the lowest speed defines the speed
of all CPU channels in the system, also for the channels of the
second CPU if configured.
For real memory speed (depending on memory type / population),
please check the spreadsheet "Memory speed" below

Mix of memory modules is only possible within the same group

H

Memory Configuration PRIMERGY BX920 S3

Each CPU offers 6 **Slots** for DDR3 Memory Modules organised in **2 Banks and 3 Channels.**
If you need more than 6 Slots you have to configure the 2nd CPU.
Depending on the amount of memory configured you can decide between 4 basic modes of operation (see explanation below).

There are 3 different kinds of DDR3 Memory Modules available: UDIMM / RDIMM and LRDIMM
UDIMM / RDIMM / LRDIMM offer different functionality. Mix of UDIMM / RDIMM / LRDIMM is not alloved.

If 1.5V and 1.35V DIMMs are mixed, the DIMMs will run at 1.5V

Mode	Configuration	UDIMM	RDIMM	RDIMM LRDIMM	Application
		x8	x8	x4	
SDDC (chipkill) support	any	no	no	yes	detect multi-bit errors
Independant Channel Mode	1, 2 or 3 Modules per Bank	no	yes	yes	offers max. flexibility, upgradeability, capacity use UDIMM modules for lowest cost
Mirrored Channel Mode *)	2 identical Modules / Bank	no	no	yes	offers maximum security
Performance Mode	3 identical Modules / Bank	no	yes	yes	offers maximum performance and capacity
Rank Sparing Mode *)	min. 2 Ranks / Channel	no	no	yes	balances security and capacity

*) For the delivery ex works the system will be prepared with dedicated BIOS setting.

Capacity	Configuration	UDIMM	RDIMM	LRDIMM	Notes
Min. Memory per CPU	1 Module / CPU	na	1x4GB	1x 16GB	with one CPU
Max. Memory per CPU	4/6 Modules / CPU	na	6x16GB	6x 32GB	with one CPU
Max. Memory per System	8/12 Modules / System	na	96GB	384GB	if second CPU is configured

Memory-Speed:
Max. DDR3 memory speed depends on the memory configuration on one memory channel and the speed of the CPU
The memory channel with the lowest speed defines the speed of all CPU channels in the system

Mem. Speed provided by CPU	Real maximum memory-bus speed depending on CPU type, memory configuration (DPC) and voltage setting (BIOS)																	
	UDIMM 1600MHz						RDIMM 1600MHz						LRDIMM 1333MHz					
Voltage setting (BIOS)	1.5V [default]			1.35V			1.5V [default]			1.35V			1.5V [default]			1.35V		
	1 DPC	2 DPC	3 DPC	1 DPC	2 DPC	3 DPC	1 DPC	2 DPC	3 DPC	1 DPC	2 DPC	3 DPC	1 DPC	2 DPC	3 DPC	1 DPC	2 DPC	3 DPC
CPU with 1600MHz DDR3 Bus	1333 1600	1333	- -	1066 1333	1066	- -	1600	1600	- -	1333	1333	- -	1333	1333	-	1066	1066	- -
CPU with 1333MHz DDR3 Bus	1333	1333	-	1066	1066	-	1333	1333	-	1333	1333	-	1333	1333	-	1066	1066	-
CPU with 1066MHz DDR3 Bus	1066	1066	-	1066	1066	-	1066	1066	-	1066	1066	-	1066	1066	-	1066	1066	-

on special release
as soon as available

1R - Single Rank
2R - Dual Rank
4R - Quad Rank

1DPC = 1 DIMM per Channel
2DPC = 2 DIMM per Channel
3DPC = 3 DIMM per Channel

Configuration hints:

- The memory sockets on the systemboard offer a color coding:
  Bank I   black sockets
  Bank II   blue sockets
  Bank III green sockets

- A so called Bank consits of 1 memory module on every Channel available on one CPU (examples see below)
  Bank I on CPU 1/2   up to 3 memory modules connected to Channel A - F on the 1st/2nd CPU
  Bank II on CPU 1/2   up to 3 memory modules connected to Channel A - F on the 1st/2nd CPU
- See below and next page for a detailed descriptions of the memory configuration supported.

1. Independent Channel Mode

	Channel A	Channel B	Channel C		Channel D	Channel E	Channel F	

Bank I
(black sockets)

Bank II
(blue sockets)

| Data | Data | Data | | Data | Data | Data |
| Data | Data | Data | | Data | Data | Data |

1st XEON CPU (4/6/8 Core)   **2nd XEON CPU** (4/6/8 Core)

- required
- required if 2nd CPU is configured
- optional, same type in Bank per CF
- optional, any type
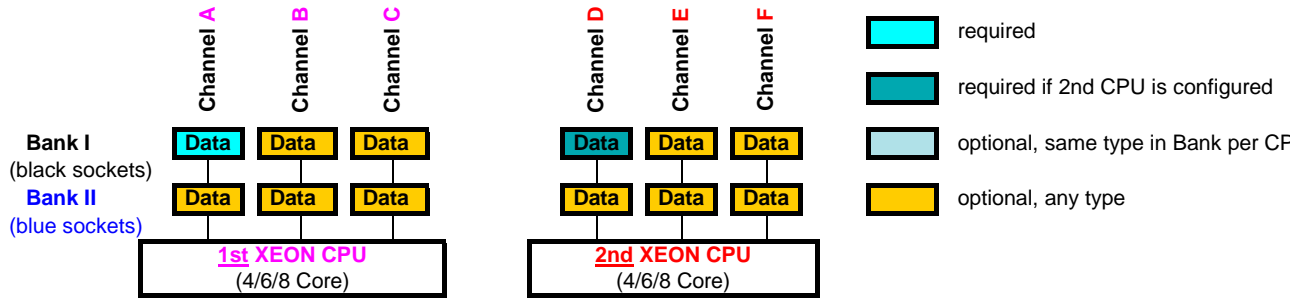
Independent Channel Mode allows all channels to be populated in any order
Can run with differently rated DIMMs and use the settings of the slowest DIMM installed in the system

2. Mirrored Channel Mode

| | Channel A | Channel B | Channel C | | Channel D | Channel E | Channel F | |

Bank I
(black sockets)

Bank II
(blue sockets)

| Data | Mirror | -------- | | Data | Mirror | -------- |
| Data | Mirror | -------- | | Data | Mirror | -------- |

1st XEON CPU (4/6/8 Core)   **2nd XEON CPU** (4/6/8) Core)

- required
- required if 2nd CPU is configured
- optional, same type in Bank per CF
- -------- not used
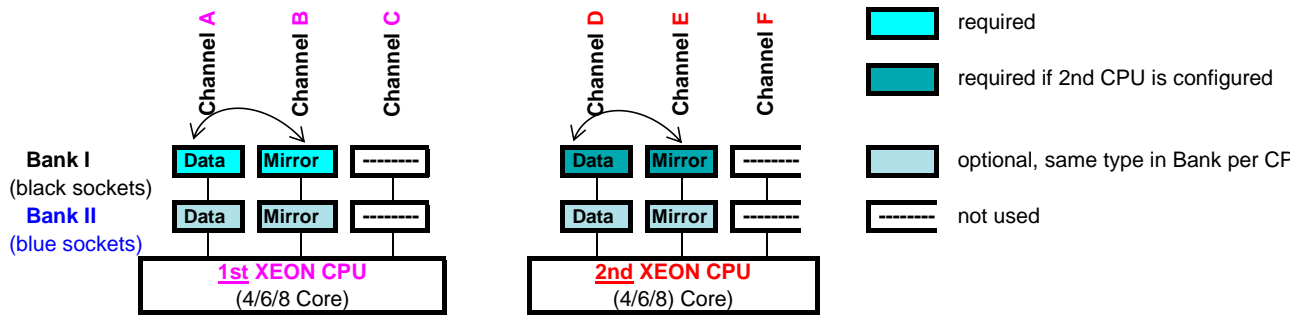
Mirrored Channel Mode requires identical modules on channel A / B (1st CPU) or channel D / E (2nd CPU)
50% of the capacity is used for the mirror => the available memory for applications is only half of the installed memory
If this mode is used, a multiple of 2 identical modules has to be ordered.

3. Performance Channel Mode

| | Channel A | Channel B | Channel C | | Channel D | Channel E | Channel F | |

Bank I
(black sockets)

Bank II
(blue sockets)

| Data | Data | Data | | Data | Data | Data |
| Data | Data | Data | | Data | Data | Data |

1st XEON CPU (4/6/8 Core)   **2nd XEON CPU** (4/6/8) Core)

- required
- required if 2nd CPU is configured
- optional, same type in Bank per CF
- optional, any type
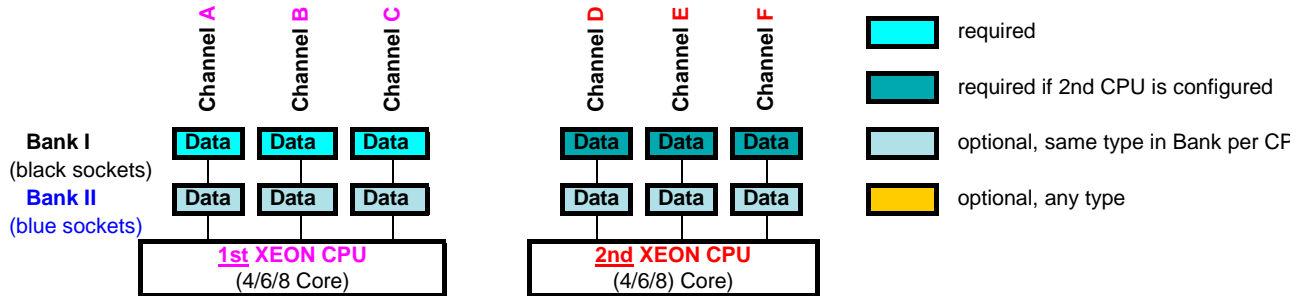
Performance Channel Mode requires identical modules on all channels of each Bank per CPU.
If this mode is used, a multiple of 3 identical modules has to be ordered.

4. Rank Sparing Mode

1-Rank Memory modules (RDIMM)

	Channel A	Channel B	Channel C		Channel D	Channel E	Channel F			
Bank I (black sockets)	Spare	Spare	Spare		Spare	Spare	Spare		▮ (cyan)	required
Bank II (blue sockets)	Data	Data	Data		Data	Data	Data		▮ (teal)	required if 2nd CPU is configured

1st XEON CPU (4/6/8 Core)   **2nd XEON CPU** (4/6/8) Core)

- ▮ (light blue) optional, same type in Channel per
- ▮ (orange) optional, any type
- ▯ (white)

2-Rank Memory modules (RDIMM)

		Channel A	Channel B	Channel C		Channel D	Channel E	Channel F
Bank I (black)	R1	Spare	Spare	Spare		Spare	Spare	Spare
	R2	Data	Data	Data		Data	Data	Data
Bank II (blue)	R1	Data	Data	Data		Data	Spare	Spare
	R2	Data	Data	Data		Data	Data	Data

1st XEON CPU (4/6/8 Core)   **2nd XEON CPU** (4/6/8) Core)

- ▮ (cyan) required
- ▮ (teal) required if 2nd CPU is configured
- ▮ (light blue) optional, same type in Channel per

4-Rank Memory modules (LRDIMM)

		Channel A	Channel B	Channel C		Channel D	Channel E	Channel F
Bank I (black)	R1	Spare	Spare	Spare		Spare	Spare	Spare
	R2	Data	Data	Data		Data	Data	Data
	R3	Data	Data	Data		Data	Data	Data
	R4	Data	Data	Data		Data	Data	Data
Bank II (blue)	R1	Data	Data	Data		Data	Spare	Spare
	R2	Data	Data	Data		Data	Data	Data
	R3	Data	Data	Data		Data	Data	Data
	R4	Data	Data	Data		Data	Data	Data

1st XEON CPU (4/6/8 Core)   **2nd XEON CPU** (4/6/8) Core)

- ▮ (cyan) required
- ▮ (teal) required if 2nd CPU is configured
- ▮ (light blue) optional, same type in Channel per
- ▮ (orange) optional, any type
- -------- not used

Rank Sparing Mode requires identical modules (same capacity and technology) within the same channel.
The available memory for applications will vary depending on configuration. Please refer to the spreadsheet above
"Effective Memory capacity with active Rank Sparing Mode". Population rule for Rank sparing mode is to achieve max.
available memory.

Change Report

Date	Order number	Changes
2015-07-21		Added 2.5" SAS 12G HDDs.
2015-02-13		Infiniband Mezzanine Cards removed
2014-05-14	S26361-F4481-E1	Added hint for non supported redundant path
2014-03-20	S26361-F4994-E402	Added 16 Gb FC Mezz Card
2013-11-11	S26361-F3807-E515	update on Memory UDIMM on special request
2013-09-27	S26361-F4531-Exxx	Replace S26361-F4531-E100 / -E512 by S26361-F4531-E300 / -E513
2013-09-10	S26361-F5307-Exxx	update on SSD SATA product numbers
2013-09-10	S26361-F5247-E112	update on HDD SAS 10K 1.2TB product number
2013-06-21	S26361-F529x-Exxx	update on CPU product numbers
2013-03-25	S26361-F37xx-E61x	update on Memory UDIMM and LRDIMM