SAP

Master Configurations with HP ProLiant Servers

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Directory 1:
T-shirt sizings for SAP ERP & SAP Business Suite

Subject	Slide Nr.
Directory	2 - 4
Preface / introduction	5 - 9
Definition of SAP ERP & SAP Business Suite	10 – 11
SAP ECC 6.0 & Customer Relationship Managemtent / CRM 2007	13 – 14
Service Specifications & Categories for SAP ECC 6.0 & CRM 2007	15 – 16
SAP Business Intelligence / BI 7.0	17 – 18
SAP BI -Accelerator	19 – 22
SAP Process Integration / PI 7.1 (before XI / Exchange Information)	23 – 24
SAP Enterprise Portal / EP 7.0	25 – 26
SAP Supplier Relationship Management / SRM 5.0	27 – 28
SAP Supply Chain Management / SCM ; Advanced Planer & Optimizer / APO 4.1	29 – 30
Solution Manager	31

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Directory 2:
Server & StorageWorks Hardware Technology

Subject	Slide Nr.
Introduction	33
Intel ProLiant 2 Processor / Socket Server (Quad Core)	34
Intel ProLiant 4 Processor / Socket Server (Quad Core)	35
Intel ProLiant 4 Processor / Socket Server (Six Core)	36
AMD ProLiant 2 Prozessor / Socket Server (Quad Core)	37
AMD ProLiant 4 Prozessor / Socket Server (Quad Core)	38
AMD ProLiant 8 Prozessor / Socket Server (Quad Core)	39
StorageWorks entry level – MSA based	40
StorageWorks Enterprise Solution (EVA 4400, 6100, 8100)	41 – 42
HP Storage & Backup Solutions for business continuity & availability	43

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Directory 3:
HP SAP Landscapes / Solutions

Subject	Slide Nr.
Basic informations to SAP landscapes	45
ERP cluster scenario with EVA4400	46
ERP cluster scenario for mirrored data centers with two EVA8100	47
SAP business suite with blades & and EVA4400	48
Virtualized SAP Landscapes	49

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Preface

For effective use of this slide set, we strongly recommend to read through the preface!

- This slide set is primarily intended as a working tool for the SAP Competence Center; providing support for our partners and customers.
- Each of the SAP solutions presented is based on two certified HP ProLiant servers. These proposals are intended to provide a general reference only; however, these proposals do not replace customer specific sizing!
- Mixing the different SAP applications might require different server & storage configurations as proposed in this guide.
- This is not a marketing document to position different HP platforms with regard of SAP configurations – it is a tool for daily sales work.
- For sizing requests please contact:

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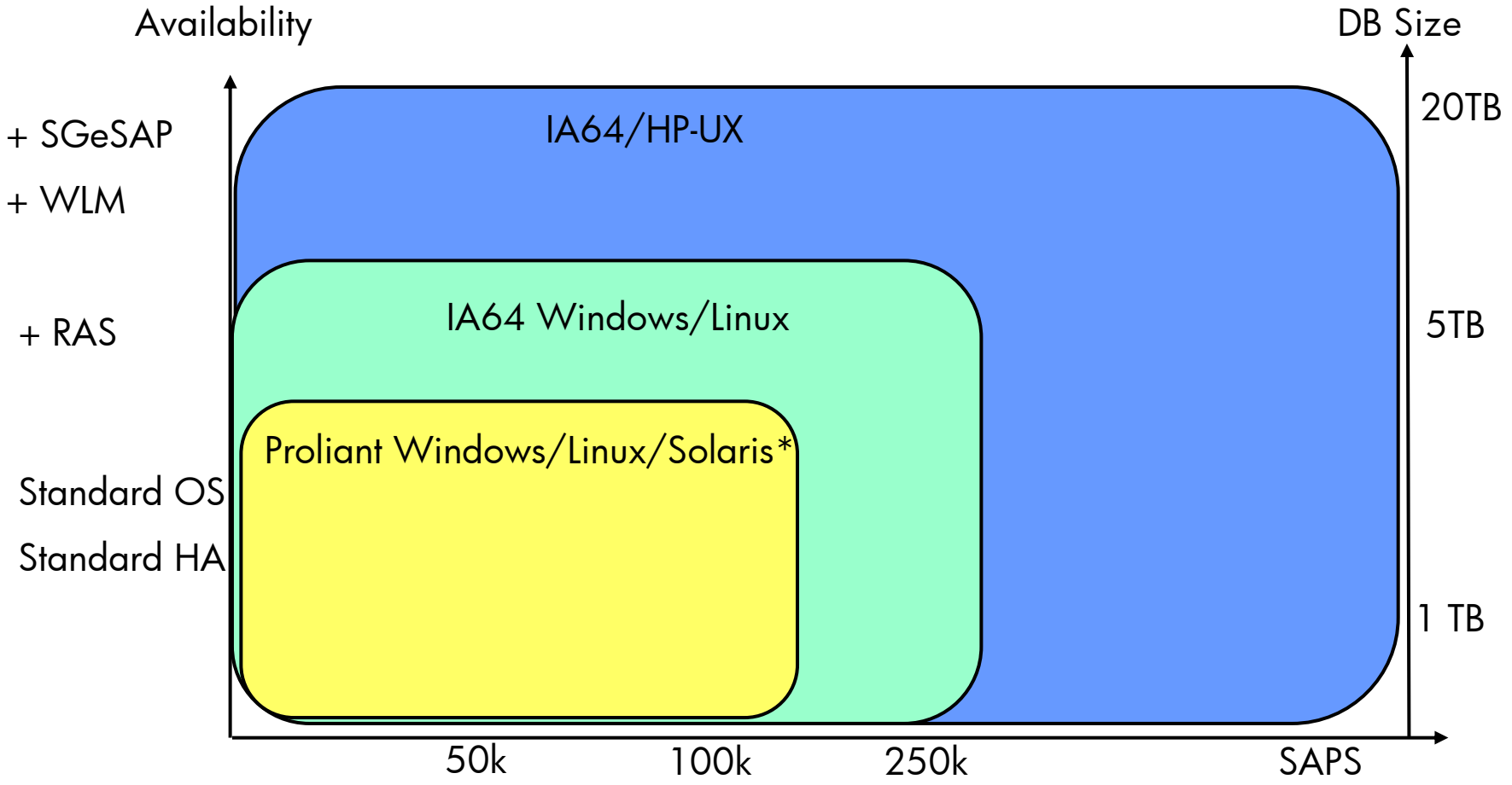
Preface: Platform Guide for SAP Solutions



*some restrictions apply,….

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Preface

- Server Design & Performance:
  - The term CPU is equivalent with socket or processors such as a two CPU Quad Core server contains 8 Cores.
  - For availability and performance reasons, HP recommends for SAP ProLiant servers a minimum configuration of two processors or sockets.
  - Depending on customer requirements in relation to data throughput (LAN; SAN); memory extension and scalability of the server it might be advantageously to choose 4-socket servers as they provide more PCI-slots (data throughput) and memory slots as 2-socket machines.
  - In smaller system landscapes, we offer more powerful server systems than required by SAPS. With Intel Xeon or AMD Quad Core technology the systems offer huge CPU reserves.
  - Although one CPU might be able to cover system requirements of smaller systems (especially for non productive environments), we recommend using two CPUs.
    - For clarification – one 2.0 GHz Quad Core CPU costs about 250€ list price. Also bear in mind that two CPUs improve server memory addressing and redundancy!
- The sizes of the test- and quality assurance systems are related to the size of the given production system and serve as a general guide.
- The database sizes are based on SAP CC experiences.
- We strongly recommend to get in touch with our StorageWorks specialists in our SAP CC regarding the following topics:
  - Selection of appropriate storage array like SWD All-in-One, storage blades, MSA, EVA or even XP, based on customer requirements
  - Backup & restore and availability concepts considering recovery point, recovery time and general availability
  - Consolidation of backup and the various associated topics like tape backup, virtual tape libraries, disk-assisted backup, local and remote mirroring including cluster integration with CLX or MetroCluster
- Value-added tax (sales tax) is not included in the prices (see separate excel worksheet) listed.

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Preface: SAP System Landscapes – Basics!

- When running business critical processes on an SAP production system, you have to customize and develop on a separate SAP system, called the **development system**. Upon completion of a change, the change needs to be transferred to a

- **quality assurance system** (also called **test system**), where the changes will be tested with master data, ported from the **production system**. When it has been verified that the changes function correctly, these changes will be ported from the development system to the production system. Consequently, SAP recommends the implementation of at least three systems in every SAP project.

- On big systems, we recommend the additional installation of a **lab system** for testing new software versions and operational concepts. Another critical task handled by the lab system is to verify **if backups from the production system can be restored**, implying that the database size needs to be the same as that on the production system.

- If your **production system** is deployed on a **cluster**, SAP **strongly recommends** the installation of a **lab system** which is also operated **in a cluster**.

- HP recommends to provide high availability for production systems and to use a cluster generally for 300 users and above.

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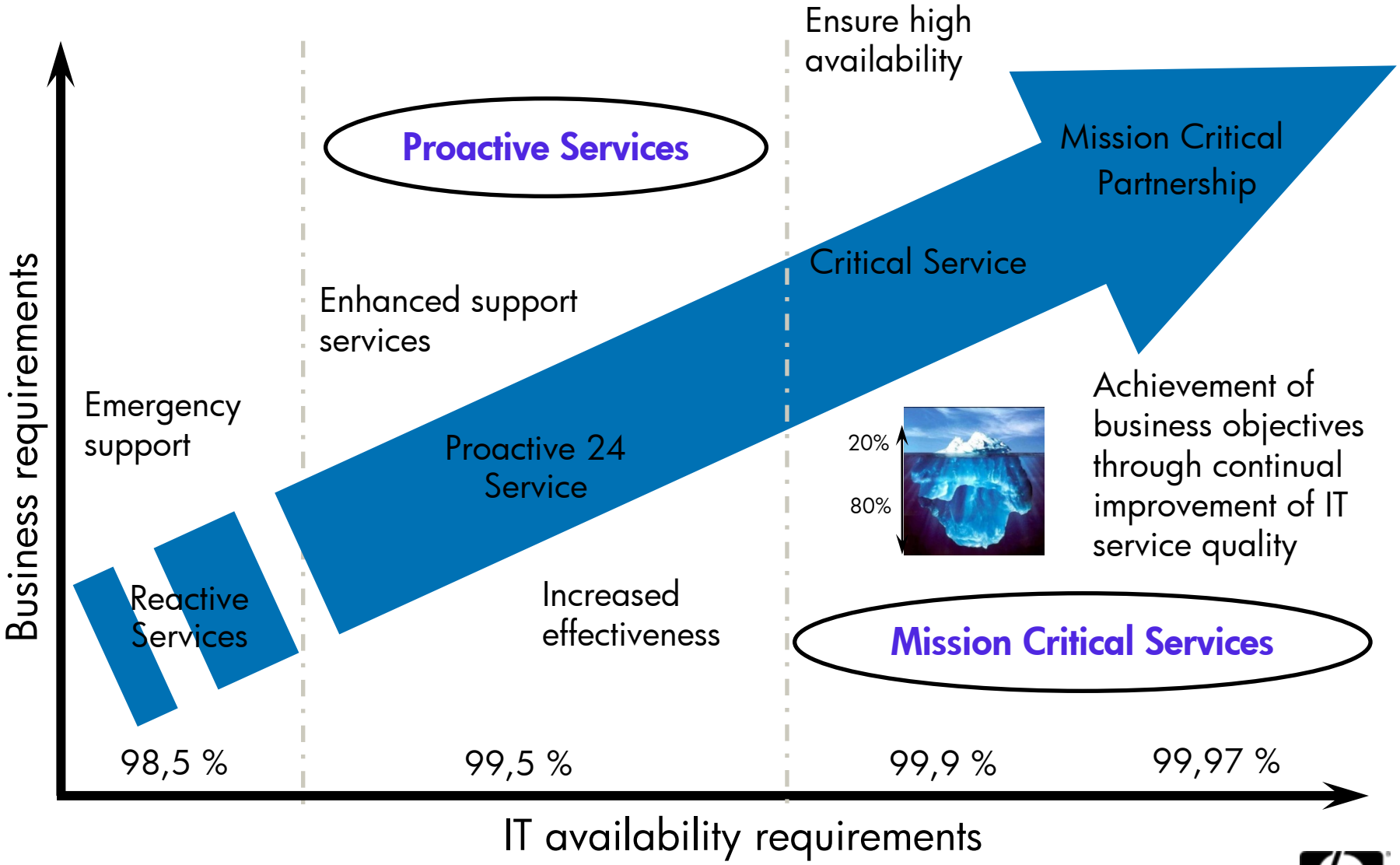
Preface: Guideline for HP Services



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SAP ERP – the components

- SAP ERP Central Component (current Release **ECC 6.0**)
  - The former SAP R/3 will end in year 2012; the Netweaver based follow up Bundle ERP will offer Service Oriented Architecture. The technical replacement of SAP R/3 Enterprise is SAP ECC (Enterprise Central Componets).
- SAP Business Intelligence - **BI** (SAP Netweaver)
- SAP Enterprise Portal - **EP** (SAP Netweaver)
- SAP Process Integration **PI** before XI (SAP Netweaver)
- SAP Web Application Server (SAP Netweaver)
- SAP Supplier Relationship Management - (only self-service-procurement scenario)
- SAP Strategic Enterprise Management
- SAP E-Recruitment (engine for extra listprice)
- SAP Learning Solution (engine for extra listprice)
- SAP Financial Supply Management (engine for extra listprice)
- Employee Self-Services / Manager Self-Services

Not part of this solution map

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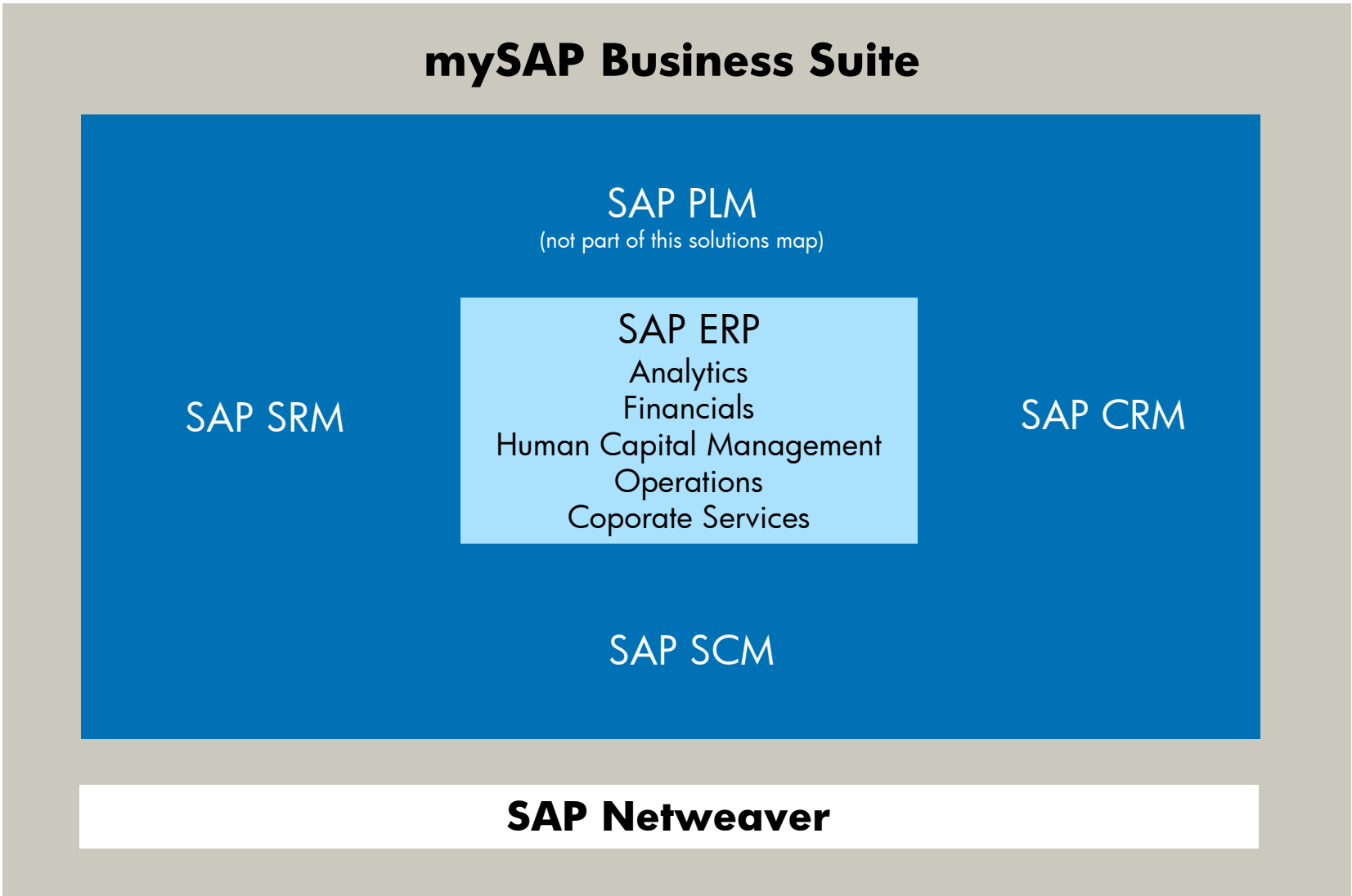
SAP Business Suite & SAP ERP



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The SAP Core Applications & Corresponding T-Shirt Sizing recommendations

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SAP ECC & CRM Sizing Considerations

- The following block diagram is user based. A user based sizing can be done by HP Sizer or SAP Quicksizer. Quantity based (requires expert know-how) sizing can only be done by SAP Quicksizer or SAP CC. The description refers to concurrent users; that means SAP users effective working on the system and not the number of SAP licenses or logged-on users. This is a good approximation; and this is verified by our experience; is a ratio of one concurrent user for two SAP licenses (50%).

- As every SAP system has to be customized to the individual customer requirements, it creates variable load. To provide for adequate system reserves, we estimate a minimum of 10 SAPS (SAP Application Performance Standard) for each concurrent user that is equivalent to a medium SAP SD (Sales & Distribution) user.

- The performance of the servers (CPUs) has increased during the last years; you have to put adequate memory into the servers. A rational starting base for production systems is to calculate 4- until up to 8 GB per Core. Be aware that you only get the feasible SAPS values of the respective servers when using sufficient memory (for instance 32 GB for 2- socket- & 64 GB for 4- socket servers).

- The size of the database is based on our experience and best practices. On smaller databases we have to prioritize performance instead of capacity.

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SAP ECC 6.0 & CRM 2007; T-Shirt Server Sizing Categories

	Comfort Sizing Area • Generous measured CPU resources by 2-Processor Quad CoreTechnology • Easy scalable by increasing the memory in the servers • For high availability requirements cluster & SAN storage recommended • In the majority of cases user based sizing • HP services recommended (for those countries where SAP TS Services are available)		**Advandced Sizing Area** **Contact SAP CC !** • High availability – cluster & SAN mandatory • Quantity / special sizing recommended • Desaster tolerance to be discussed • HP services mandatory (for those countries where SAP TS Services are available)		**Expert Sizing Area** **Contact SAP CC !** • Detailed customer consulting mandatory • High availability – cluster & SAN mandatory • Quantity / special sizing mandatory • Desaster tolerance recommended / mandatory • HP services mandatory (for those countries where SAP TS Services are available)	
Concurrent medium SD Users	**200 User**	**500 User**	**900 User**	**1800 User**	**To be defined**	**To be defined**
Database Server Production System(Central System) respective NetWeaver 2004s cluster incl. App. Server	2 CPU 16 GB RAM Server char. A or I Storage char. A2 or B1 ~400GB DB net	2 CPU 32 GB RAM Server char. B or J Storage char. B2 ~1,0 TB DB net	2/4 CPU 64 GB RAM Server char. C; K; D or L Storage char. B2 ~1,8 TB DB net	4 CPU 128 GB RAM Server char. E; G; M or O Storage char. D1 ~ 3,6 TB DB net	Depends on detailled Sizing Server char. F; N; H; P or Q Storage char. >= D1	Depends on detailled Sizing Server char. F; N; H; P or Q Storage char. >= D2
Test- & Quality Assurance System (Central System)	2 CPU 16 GB RAM Server char. A or I Internal Storage or SAN DB size as prod.	2 CPU 16 GB RAM Server char. A or I SAN DB size as prod.	2 CPU 32 GB RAM Server char. B or J SAN DB size as prod.	2 CPU 32 GB RAM Server char. B or J SAN DB size as prod.	2/4 CPU 64 GB RAM Server char. C; K; D or L SAN DB size as prod.	2/4 CPU 64 GB RAM Server char. C; K; D or L SAN DB size as prod.
Development System (Central System)	2 CPU 16 GB RAM Server char. A or I Internal Storage or SAN ~100GB DB net	2 CPU 16 GB RAM Server char. A or I SAN ~200GB DB net	2 CPU 16 GB RAM Server char. A or I SAN ~200GB DB net	2 CPU 16 GB RAM Server char. A or I SAN ~200GB DB net	2 CPU 32 GB RAM Server char. B or J SAN ~200GB DB net	2 CPU 32 GB RAM Server char. B or J SAN ~200GB DB net
Recommended Service	Support Plus 24	Support Plus 24	Proactive 24	Proactive 24	Critical Service	Critical Service

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Service Specifications

The key to improving IT operational effectiveness is to coordinate activities across all the components of your infrastructure. HP Service includes consistent proactive and reactive services across the whole infrastructure, including hardware, software and specialized solution support for SAP environments.

Reactive support (Support Plus 24) is delivered through HP's global support infrastructure. Reactive Support Services focus on fast and full restoration in the event of a failure, so any problems are fixed quickly and cost-effectively. HP provides industry-leading call-to-resolution commitments for hardware, including a six-hour call-to-repair commitment for hardware. HP's Global Solution Centers are located in key points around the globe, so they can work on any issues 24x7, 365 days a year.

Proactive onsite support services, delivered by availability and technical experts at your site, help you continually improve your IT operations. These services are based on industry standards for IT service management, such as ITIL, and HP's own experience in managing mission critical business applications. With a proactive approach and remote support technology HP helps you identify, diagnose and resolve problems before they cause downtime, through monitoring and analysis of your mission critical environment.

HP **Proactive 24** Service helps to improve the stability, availability, and operational effectiveness of your IT environment through a combination of industryleading technical assistance and proactive account services that cover the entire IT infrastructure.

HP **Critical Service** integrates proactive and reactive services to improve availability and performance for businesses where downtime can be disastrous. Critical Service combines proactive onsite expertise from HP-certified high availability experts, 24x7 priority assistance from HP's worldwide missioncritical response centers, and proactive remote support tools.

Depending on the size and the complexity of an SAP environment, we propose here a generally adequate service level.

We highly recommend getting in touch with a Service Solution Architect to select and configure the specifically appropriate service level.

- For Germany, please send service requests to germany.bc@hp.com.
- For EMEA, please send service requests to sap.hp@hp.com
- For AMA, please send service request to pss@hp.com

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SAP ECC 6.0 & CRM 2007; Service Categories

Comfort Sizing Area • Generous measured CPU resources by 2-Processor Quad CoreTechnology • Easy scalable by increasing the memory in the servers • For high availability requirements cluster & SAN storage recommended • In the majority of cases user based sizing • HP services recommended (for those countries where SAP TS Services are available)		**Advandced Sizing Area** Contact SAP CC! • High availability – cluster & SAN mandatory • Quantity / special sizing recommended • Desaster tolerance to be discussed • HP services mandatory (for those countries where SAP TS Services are available)		**Expert Sizing Area** Contact SAP CC ! • Detailed customer consulting mandatory • High availability – cluster & SAN mandatory • Quantity / special sizing mandatory • Desaster tolerance recommended / mandatory • HP services mandatory (for those countries where SAP TS Services are available)	
HP Service	**Deliverables**	**HP Service**	**Deliverables**	**HP Service**	**Deliverables**
Support Plus 24	**Service Window: 24 x 7** **Onsite Hardware Support** **Software Support** **Software Updates** **Escalationmanagement** **HW 4h react** **SW 4h react**	**Proactive 24**	**SAP trained Account Support Team** - Account Support Plan - Support Activity Reviews - Review Meetings **Proactive** - Patch assistance for OS and Storage FW - Patch assistance for database and SAP software - Quarterly Trend analysis & report - Capacity planning **Reactive** - Single point of contact - Accelerated HP-SAP troubleshootng and escalation process - Remote access via SAP/OSS infrastructure - SAP internal information access **Onsite Hardware Support** **Software Support** **Software Updates** **Escalationmanagement** **HW 4h react** **SW 2h react**	**Critical Service**	**SAP trained Account Support Team** - Account Support Plan - Support Activity Reviews - Review Meetings **Proactive** - Availability Checkup - Availability Healthcheck - Quarterly Activity reviews - HW preventative maintenance - Patch assistance for OS and Storage FW - Patch assistance for database and SAP software - Monthly Trend analysis & report - Capacity planning **Reactive** - Single point of contact - Accelerated HP-SAP troubleshootng and escalation process - Enhanced Parts Inventory - Remote access via SAP/OSS infrastructure - SAP internal information access **Onsite Hardware Support** **Software Support** **Software Updates** **Escalationmanagement** **HW 4h Call to Repair** **SW react at once**
Availability	**98,5%**	**Availability**	**99,5%**	**Availability**	**99,9%**

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SAP BI Sizing Considerations

- The SAP BI configuration examples represent 2 different sizes of BI landscapes, based on practical experience. The medium configuration represents the most common type. These examples are intended for a first budgetary proposal, when no detailed data quantities are available.
- Sizing BI-BPS based on user numbers is not possible!! The 2 examples are therefore without usage of BI-BPS. For **BI-BPS data quantities are essential!**
- A well-founded BI sizing has to be done by defining detailed data quantities for the SAP Quicksizer tool. To determine the data quantities, the **operating departement** and the **BI consultant** need to collaborate closely.
- Rough data estimations without existing blueprint about BI components (e.g. number of Info Cubes, ODS Objects ..), cannot lead to a valid sizing result. **Even minor changes in the input parameters can change the result considerably.**

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SAP BI – T-Shirt Sizing Categories

	Production Environment	Test- & Development Environment (2 instances)
Small • Up to 100 concurrent users • 70% Infos User • 20% Executive User • 10% Power user • only pre-defined • Info Cubes • Non Unicode; for Unicode add 50% Memory and 30% CPU • No web reporting included	**BI Central System** 2 CPU 16 GB RAM Server char. **A** or **I** external Storage; SAN recommended Storage char. **A2** or **B1** 200-400 GB DB net	**BI Central System** 2 CPU 16 GB RAM Server char. **A** or **I** external Storage; SAN recommended 150 GB DB net
Medium • Up tp 200 concurrent users: • 70% Infos User • 20% Executive User • 10% Power user • only pre-defined • Info Cubes • Non Unicode; for Unicode add 50% Memory and 30% CPU • No web reporting included	**BI Central System** 2 CPU 32 GB RAM Server char. **B** or **J** external Storage; SAN recommended Storage char. **A2** or **B1** 200-400 DB net	**BI Central System** 2 CPU 16 GB RAM Server char. **A** or **I** external Storage; SAN recommended 200-400 GB DB net

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SAP BI Accelerator - Sizing Considerations

- There is an ABAP Report on the SAP Marketplace available (SAP Note-917803) that the customer should run over all Info Cubes that will be transferred into BIA
- --> please download the latest version of the ABAP Report from the SAP Marketplace (SAP Note-917803)
- This means that the customer has to decide in a first step which Cubes he will shift into BIA. In a second step he should run the ABAP Report in detail only over these Cubes (that will be shifted into BIA!!)

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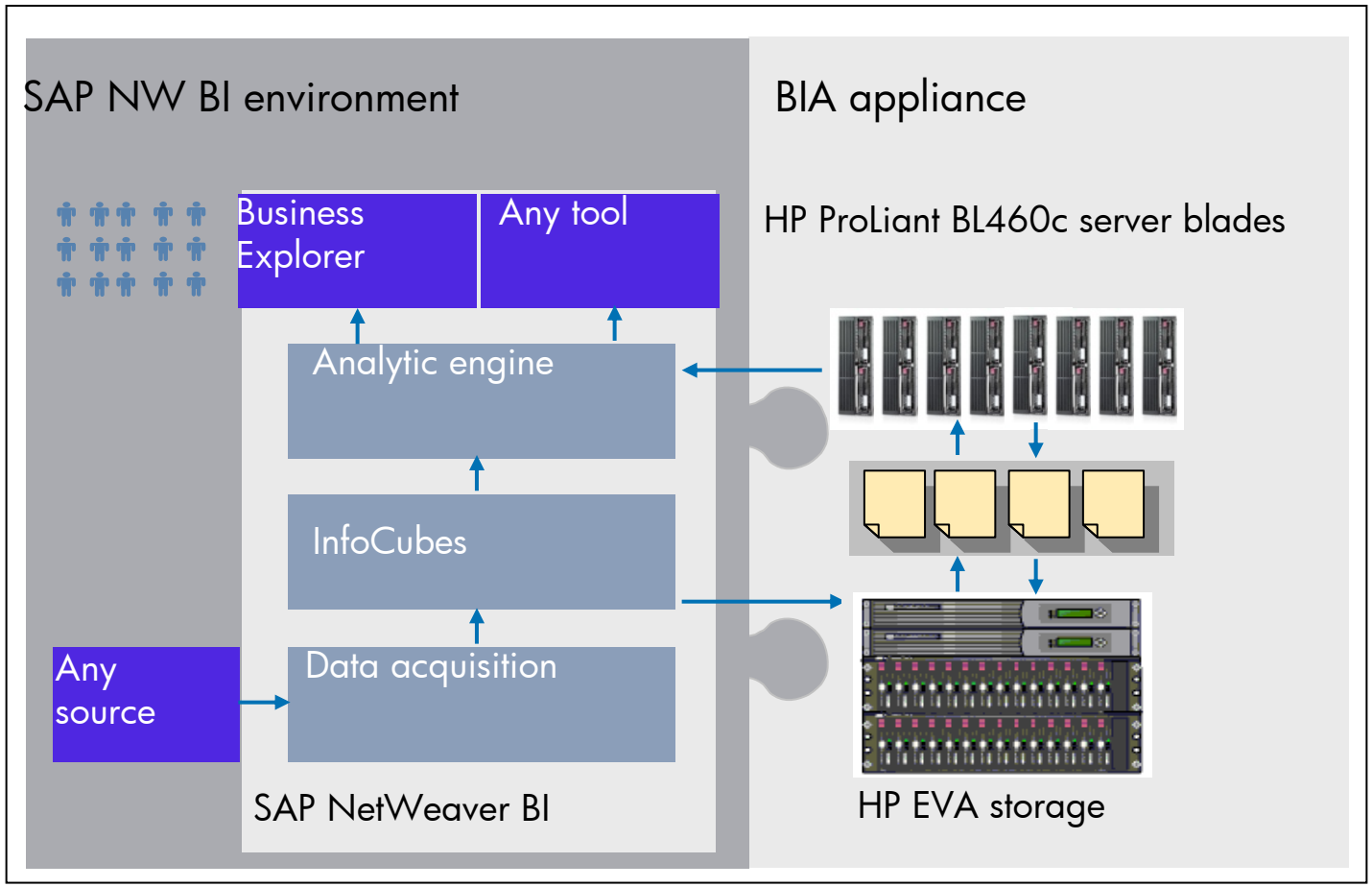
HP's holistic approach to the BI accelerator

BI preparation → BIA configuration → BIA installation → BI system optimization → Mission critical support



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BIA „Light“ Configuration

Start Configuration
1 x AIO Shared Storage
2 x BL460c Quad Core &
8 GB RAM or 16 GB RAM

Redundancy
With a spare blade functionality
1 x BL460c Quad Core &
8 GB RAM or 16 GB RAM

Backup Integration
In the enclosure with
a blade tape drive

Scaling
with 2 x BL460c Quad Core &
8 GB RAM or 16 GB RAM

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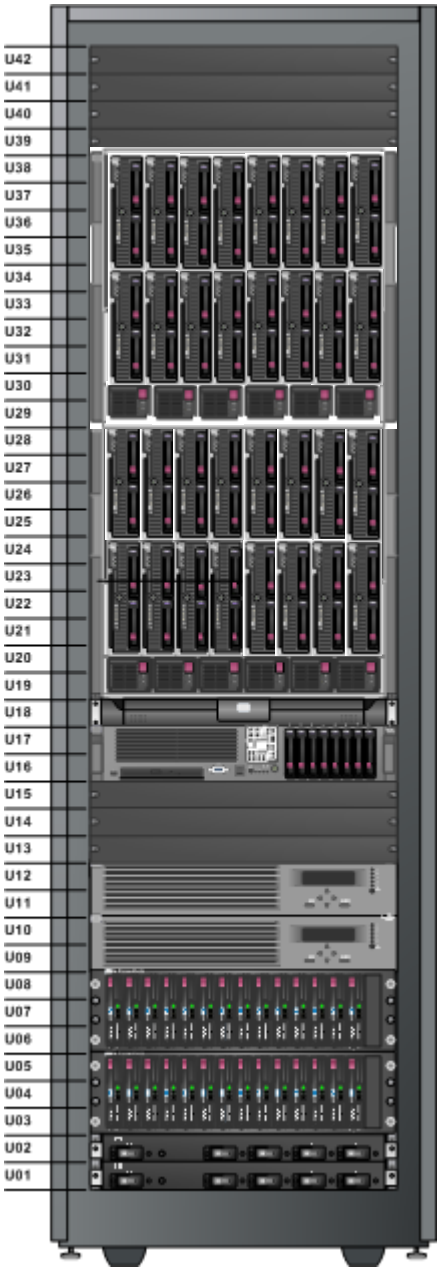
BIA Standard Configuration



Scaling !
by further
16 x BL460c Quad Core &
16 GB RAM or 32 GB RAM

Upgradable !
with 12 x BL460c Quad Core &
16 GB RAM or 32 GB RAM

Start Configuration !
1 x EVA Shared Storage
4 x BL460c Quad Core &
16 GB RAM or 32 GB RAM

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SAP Exchange Infrastructure (SAP PI/XI) Sizing Considerations

- Following hardware proposals for SAP Exchange Infrastructure refer to SAP PI v7.0
- Given SAPS figures relate to mainly asynchronous IDoc message transfers being processed
- The performance corridor given is for orientation purposes only and can not be granted
- The given information on approx. back-end SAP system(s) is for orientation purposes only
- Customer-specific implementations of SAP PI may require significantly more resources

Please visit

http://www.service.sap.com/instguidesnw04s -> Planning -> Exchange Infrastructure for PDF 'SAP PI 7.0 High-Availability Guide'

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SAP Exchange Infrastructure (SAP PI/XI) T-Shirt Proposals

	Production Environment	Test- & Development Environment
Small • back-end SAP system(s) • up to 10,000 to 15,000 SAPS	**XI Central System** 2 CPU 16 GB RAM Server char. **A** or **I** Internal Storage or SAN Storage char. **A2** or **B1** 200 GB DB net	**XI Central System** 2 CPU 16 GB RAM Server char. **A** or **I** Internal Storage or SAN 200 GB DB net
Medium • back-end SAP system(s) • up to 15,000 to 25,000 SAPS	**XI Central System** 2 CPU 32 GB RAM Server char. **B** or **J** Internal Storage or SAN Storage char. **A2** or **B1** 200 GB DB net	**XI Central System** 2 CPU 16 GB RAM Server char. **A** or **I** Internal Storage or SAN 200 GB DB net

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SAP EP 7.0

- Portal is Java only
- Load distribution is about 1:10 (DB vs. SAP)
- Portal sizing is only user-driven – Sizing parameters are number of users:
    - logged in users for memory sizing
    - active users for CPU Sizing
- about 500 active working users per core (SAP Component only)
- add one core for the OS and do not forget the 10% DB uplift
- about 6 GB memory per core; alternatively 6-8 GB per 1.000 SAPS
- DB size is about 140 GB (without using CM/KM/Trex) independend of the number of users
- Standard sizing does not include using of home-grown IViews – only SAP standard
- Front-end is a web-based infrastructure (Loadbalancer, ReverseProxy, SSL Termination, etc.) which is not included in the sizing but has to be considered

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SAP EP – Sizing categories

Always refer to the current SAP PAM (Product Availability Matrix) for NetWeaver supported platforms and OS - http://service.SAP.com/PAM

	Production Environment			Test- & Development Environment	
	Application	Database	Trex (optional)	Application & Database	Trex (optional)
Small 1000 concurrent user Only standard iViews	EP 7.0 central system 2 CPU 16 GB RAM 2 x 146 GB intern Server char. A or I Internal Storage or SAN Storage char. A2 or B1 140 GB DB net plus content (optional)		2 CPU 16 GB RAM 2 x 146 GB intern Server char. A or I Internal Storage	2 CPU 16 GB RAM 2 x 146 GB intern Server char. A or I Internal Storage or SAN Storage char. A2 or B1 146 GB DB net	2 CPU 16 GB RAM 2 x 146 GB intern Server char. A or I Internal Storage
Medium 2500 concurrent user Only standard iViews	EP 7.0 central system 2 CPU 32 GB RAM 2 x 146 GB intern Server char. B or J Internal Storage or SAN Storage char. A2 or B1 140 GB DB net plus content (optional)		2 CPU 16 GB RAM 2 x 146 GB intern Server char. A or I Internal Storage	2 CPU 16 GB RAM 2 x 146 GB intern Server char. A or I Internal Storage or SAN Storage char. A2 or B1 140 GB DB net	2 CPU 16 GB RAM 2 x 146 GB intern Server char. A or I Internal Storage
Large 6000 concurrent user Only standard iViews	EP 7.0 central system 4 CPU 128 GB RAM 2 x 146 GB intern Server char. E; G; M or O Internal Storage or SAN Storage char. A2 or B 140 GB DB net plus content (optional)		2 CPU 16 GB RAM 2 x 146 GB intern Server char. A or I Internal Storage	2 CPU 16 GB RAM 2 x 146 GB intern Server char. A or I Internal Storage or SAN Storage char. A2 or B1 140 GB DB net	2 CPU 16 GB RAM 2 x 146 GB intern Server char. A or I Internal Storage

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SAP SRM Sizing Considerations

- The SAP SRM configuration examples represent 2 different sizes of SRM & CCM landscapes, based on practical experience. The SRM small configuration and the CCM medium configuration represent the most common type.
  These examples are intended for a first budgetary proposal, when no detailed data quantities are available.

- A well-founded SRM sizing has to be done by defining detailed data quantities for the SAP Quicksizer tool. To determine the data quantities, the **operating department** and the **SRM consultant** need to collaborate closely.

- Rough data estimations without existing blueprint about SRM scenarios (e.g. self service procurement, plan driven procurement, service procurement …) to be implemented cannot not lead to a valid sizing result. **Even minor changes in the input parameters can change the result considerably.**

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SAP SRM – Sizing Categories

	Production Environment		Test- & Development Environment
	SRM / MDM	MDM*	SRM & MDM*
Small **SRM:** • 100 active users (medium activity **CCM:** • 30000 to 40000 entries uploading or indexinf of the catalog • Up to 100 of searches per hour • Two languages	**SRM Central System** 2 CPU 16 GB RAM Server char. A or I Internal Storage or SAN Storage char. A2 or B1 100 GB DB net	**Master Data Mgmt. System** 2 CPU 16 GB RAM Server char. A or I Internal Storage or SAN Storage char. A2 or B1 100 GB DB net	**SRM & MDM Central System** 2 CPU 16 GB RAM Server char. A or I Internal Storage or SAN 100 GB DB net
Medium **SRM:** • 300 active users (medium activity) **CCM:** • 40000 to 50000 entries uploading or indexinf of the catalog • Up to 1000 of searches per hour • Two languages	**SRM Central System** 2 CPU 32 GB RAM Server char. B or J Internal Storage or SAN Storage char. A2 or B1 200 GB DB net	**Master Data Mgmt. System** 2 CPU 32 GB RAM Server char. B or J Internal Storage or SAN Storage char. A2 or B1 200 GB DB net	**Master Data Mgmt. System** 2 CPU 16 GB RAM Server char. A or I Internal Storage or SAN 100 GB DB net

* Optional or mandatory; please check the SRM standard scenarios diagram on the previous slide

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SAP APO Sizing Considerations

- The SAP APO configuration examples represent 3 different sizes of APO landscapes, based on practical experience. The medium configuration represents the most common type. These examples are intended for **a first budgetary proposal**, when no detailed data quantities are available.
- Sizing based on **user numbers** is **not possible**. The 3 examples are therefore based on business figures like characteristic combinations and different order types.
- A well-founded APO sizing has to be done by defining detailed data quantities for the SAP Quicksizer tool. To determine the data quantities, the **operating department** and the **SCM consultant** need to collaborate closely.
- Rough data estimations without existing blueprint about APO components (e.g. DP, SNP, PP/DS ..), locations, business processes to be implemented cannot not lead to a valid sizing result. **Even minor changes in the input parameters can change the result considerably.**

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SAP APO – Sizing Categories

	Production Environment		Test- & Development Environment	
	APO / LiveCache	Optimizer (optional)	APO / LiveCache	Optimizer (optional)
Small & Medium • 100.000 char. comb. • 10.000 location products, • 50.000 sales orders • 30.000 procurement orders • 50.000 forecast orders • 10.000 production orders	Central System 2 CPU 16 GB RAM Server char. B or J Internal Storage or SAN Storage char. A2 or B1 100 GB DB net	2 CPU 16 GB RAM Server char. A or I 2 x 146 GB internal	Central System 2 CPU 16 GB RAM Server char. A or I Internal Storage or SAN 100 GB DB net	2 CPU 16 GB RAM Server char. A or I 2 x 146 GB internal
Large • 250.000 char. comb. • 50.000 location products • 100.000 sales orders • 60.000 procurement orders • 100.000 forecast orders • 20.000 production orders	APO System 2 CPU 16 GB RAM Server char. A or I Internal Storage Storage char. A2 or B1 80 GB DB net LiveCache System 2 CPU 32 GB RAM Server char. B or J Internal Storage or SAN 60 GB DB net	2 CPU 16 GB RAM Server char. A or I 2 x 146 GB internal	Central System 2 CPU 32 GB RAM Server char. B or J Internal Storage or SAN 140 GB DB net	2 CPU 16 GB RAM Server char. A or I 2 x 146 GB internal

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Special Information to Solution Manager

Implement, Operate, Monitor, and Support

- SAP Solution Manager is a centralized, robust solution management toolset. It empowers companies to implement, operate, monitor, and support their SAP solutions.
- SAP Solution Manager facilitates technical support for distributed systems, with functionality that covers all key aspects of solution deployment, operation, and continuous improvement. It combines tools, content, and direct access to SAP to increase the reliability of solutions and lower total cost of ownership.
- With SAP Solution Manager, you can be sure your entire SAP solution environment is performing at its maximum potential. The toolset addresses your entire IT environment, supporting SAP and non-SAP software and covering current and forthcoming SAP solutions. As part of SAP NetWeaver, SAP Solution Manager is included in the annual maintenance fee for SAP solutions.
- SAP Solution Manager targets both technical and business aspects of your solutions, focusing strongly on core business processes. It supports the connection between business processes and the underlying IT infrastructure. As a result, it eases communication between your IT department and your lines of business. And ensures that you derive the maximum benefits from your IT investments.

Implementation	Service Delivery	Solution Monitoring	Change Request Management	Service Desk
Solution Management Roadmap	Proactive & Predictive Services	Business Process Monitoring	Hot Fix	SAP & Non SAP Support Prozess
Implementation Tools	Optimization Services	System Monitoring	Service – Regular Maintenance Activity	Integration SAP Support (OSS)
Customizing	Empowering (Best Practices)	Adminstration	Project – Business Change	Solution Database
eLearning Management		EarlyWatch Alert (EWA)		Web Service Portal
		Service Level Reporting		

Server Sizing Category A or I; 2 CPU; 16 GB RAM; 300 GB DB netto (internal Storage or SAN)

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Server & Storage
Hardware Technology Solutions

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Preface

The previous slides presented server- and storage characteristic information marked by alphabetic letters for use in the following slides. By combining the specifications from the T-shirt sizing data with the hardware data, you can build individual system landscapes and/or size the required components. Configuration and budgeting (German list price) details can be extracted from a separate Excel worksheet.

- Extra information on the server systems:
  - As SAP (especially Java) generally allocates a huge amount of system resources, we recommend to apply a minimum of 8- optimal 16 GB RAM per server system; as well as for non-productive systems (behold server sizing categories A & I).
  - All systems should be configured with redundant options such as host bus controller; fans and power supplies (see server configuration layout in the Excel sheet).
  - For booting from SAN, you have to plan internal server disks for the page file anyway, otherwise performance problems will arise.

- Extra information to the storage solutions:
  - Listed storage solutions are approved for running SAP; whereas in existing SAP landscapes the majority is using our Enterprise Virtual Arrays (EVA).

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2 – Socket Intel Quad Core ProLiant Server up to 12.200 SAPS

Server characteristic type A:

- ERP Productions Systems up to 200 users
- ERP Production Systems up to 100 users – with DL380G5 and internal Storage
- ERP; BI, XI, APO, CRM, SRM, Enterprise Portal test - & development systems
- XI; APO;- CRM;- SRM;- Enterprise Portal production systems
- SAP Solution Manager; Application Server
- **Server key data:**
  - 2* Xeon DP Quad Core 2,50 GHz; DL380G5 / 2,66 GHz BL460c
  - 16 GB RAM

Server characteristic type B:

- ERP Productions Systems up to 500 users
- ERP; BI, XI, APO, CRM, SRM, Enterprise Portal test - & development systems
- BI; APO;- CRM;- SRM;- Enterprise Portal production systems; Application Server
- Server key data:
  - 2* Xeon DP Quad Core 3,16 GHz; DL380G5 / 3,66 GHz BL460c
  - 32 GB RAM

Server characteristic type C:

- ERP Productions Systems up to 900 users
- BI Production Systems
- APO;- CRM;- SRM;- Enterprise Portal production systems; Application Server
- **Server key data:**
  - 2* Xeon DP Quad Core 3,16 GHz; DL380G5 / 3,00 GHz BL460c
  - 64 GB RAM

ProLiant DL380G5

ProLiant BL460 Server Blade (requires c3000/7000 Enclosure)

Only for use with external storage (SAN recommended)

Server Storage layout:

2 * 146 GB OS; Pagefile (SAN Connection; requires SAN Adapters) **or**

8* 146 GB internal Storage (only DL380G5)

For ECC Systems with more than 100 users we strongly recommend external Storage e.g. SAN (EVA) solution

Regarding the storage layout for different applications we strongly recommend collaborating with SAP CC!

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4 – Socket Intel Quad Core ProLiant Server up to 18.500 SAPS

Server characteristic type D:
- ERP Production Systems up to 900 users
- BI Production systems
- VMware Server; Application server
- **Server key data:**
  - 4* Xeon MP Quad Core 2,40 GHz; DL580G5 / 2,40 GHz BL680c
  - 64 GB RAM

Server characteristic type E:
- ERP Production Systems
- High level BI Production systems
- VMware Server; Application server
- Server key data:
  - 4* Xeon MP Quad Core 2,93 GHz; DL580G5 / 2,40 GHz BL680c
  - 128 GB RAM

Server characteristic type F:
- ERP Production Systems
- High level BI Production systems
- VMware Server; Application server
- **Server key data:**
  - 4* Xeon MP Quad Core 2,93 GHz; DL580G5
  - 256 GB RAM

Server Storage layout:

2 * 146 GB OS; Pagefile (SAN Connection; requires SAN Adapters) **or**

16* 146 GB internal Storage (only DL580G5)

Regarding the storage layout for different applications we strongly recommend collaborating with SAP CC!

ProLiant DL580G5

ProLiant BL680G5c Server Blade

(requires c3000/7000 Enclosure)

Only for use with external storage (SAN recommended)

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4 – Socket Intel Six Core ProLiant Server up to 25.800 SAPS

Server characteristic type G:

- ERP Production Systems
- High level BI Production systems
- VMware Server; Application server
- **Server key data:**
  - 4* Xeon MP Six 2,40 GHz; DL580G5 / 2,40 GHz BL680c
  - 128 GB RAM

Server characteristic type H:

- ERP Production Systems
- High level BI Production systems
- VMware Server; Application server
- **Server key data:**
  - 4* Xeon MP Six Core 2,66 GHz; DL580G5
  - 256 GB RAM

Server Storage layout:

2 * 146 GB OS; Pagefile (SAN Connection; requires SAN Adapters) **or**

16* 146 GB internal Storage (only DL580G5)

Regarding the storage layout for different applications we strongly recommend collaborating with SAP CC!

ProLiant DL580G5

ProLiant BL680G5c Server Blade

(requires c3000/7000 Enclosure)

Only for use with external storage (SAN recommended)

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2 – Socket AMD Quad Core ProLiant Server up to 13.700 SAPS

Server characteristic type I:

- ERP Productions Systems up to 200 users
- ERP Production Systems up to 100 users – with DL385G5 and internal storage
- ECC; BI, XI, APO, CRM, SRM, Enterprise Portal test - & development systems
- XI, medium APO, CRM, SRM, Enterprise Portal production systems
- SAP Solution Manager; Application Server
- **Server key data:**
  - 2* AMD Opteron Quad Core 2,4 GHz DL385G5p / 2,4 GHz BL465c
  - 16 GB RAM

Server characteristic type J:

- ERP Productions Systems up to 500 users
- ERP; BI, XI, APO, CRM, SRM, Enterprise Portal test - & development systems
- Low level BI Production Systems
- XI, medium APO, CRM, SRM, Enterprise Portal production systems; Application Server
- **Server key data:**
  - 2* AMD Opteron Quad Core 2,4 GHz DL385G5p / 2,4 GHz BL465c
  - 32 GB RAM

Server characteristic type K:

- ERP Productions Systems up to 900 users
- BI Production Systems
- APO, CRM, SRM, Enterprise Portal production systems; Application Server
- **Server key data:**
  - 2* AMD Opteron Quad Core 2,7 GHz DL385G5p / 2,7 GHz BL465c
  - 64 GB RAM

ProLiant DL385G5p

ProLiant BL465c Server Blade (requires c3000/7000 Enclosure)

Only for use with external storage (SAN recommended)

Server Storage layout:

2 * 146 GB OS; Pagefile (SAN Connection; requires SAN Adapters)

or

16* 146 GB internal Storage (only DL385G5p)

For ECC Systems with more than 100 users we strongly recommend external Storage e.g. SAN (EVA) solution

Regarding the storage layout for different applications we strongly recommend collaborating with SAP CC!

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4 – Socket AMD Quad Core ProLiant Server up to 23.500 SAPS

Server characteristic L:
- BI Production systems
- ERP Production Systems up to 900 users
- VMware Server; Application Server
- **Server key data:**
  - 4* AMD Opteron Quad Core 2,5 GHz DL585G5 / 2,7 GHz BL685c
  - 64 GB RAM

Server characteristic M:
- ERP Production Systems
- High Level BI Production systems
- VMware Server; Application Server
- **Server key data:**
  - 4* AMD Opteron Quad Core 2,5 GHz DL585G5 / 2,7 GHz BL685c
  - 128 GB RAM

Server characteristic N:
- ERP Production Systems
- High Level BI Production systems
- VMware Server; Application Server
- **Server key data:**
  - 4* AMD Opteron Quad Core 2,7 GHz DL585G5
  - 256 GB RAM

Server Storage layout:

2 * 146 GB OS; Pagefile (SAN Connection; requires SAN Adapters) **or**

16* 146 GB internal Storage (only DL585G5)

Regarding the storage layout for different applications we strongly recommend collaborating with SAP CC !

ProLiant DL585G5

ProLiant BL685c Server Blade

(requires c3000/7000 Enclosure)

Only for use with external storage (SAN recommended)

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8 – Socket AMD Quad Core ProLiant Server up to 35.400 SAPS

Server characteristic O:

- ERP Production Systems up to 1400 users
- BW Production systems
- VMware Server; Application Server
- **Server key data:**
  - 8* AMD Opteron Quad Core 2,4 GHz DL785G5
  - 128 GB RAM

Server characteristic P:

- ERP Production Systems
- BW Production systems
- VMware Server; Application Server
- **Server key data:**
  - 8* AMD Opteron Quad Core 2,5 GHz DL785G5
  - 192 GB RAM

Server characteristic Q:

- ERP Production Systems
- BW Production systems
- VMware Server; Application Server
- **Server key data:**
  - 8* AMD Opteron Quad Core 2,7 GHz DL785G5
  - 256 GB RAM

ProLiant DL785G5

Server Storage layout:

4 * 146 GB OS; Pagefile (SAN Connection; requires SAN Adapters)

or

8* 146 GB internal Storage

Regarding the storage layout for different applications we strongly recommend collaborating with SAP CC!

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StorageWorks entry level - MSA based

	AIO1200 (AK222A)	MSA 70
max. user (CC recommendation)	100	200
Connection Type	iSCSI SAN	SCSI
Maximum discs	10 netto (12 brutto -2 disk for OS = 10)	25
Disk size (only SAS drives!)	300 GB SAS	72 & 146 GB SAS
Controller recommendation (Server)	Mulifunktion Gigabit Server Adapter with optional HP ProLiant Essentials Accelerated iSCSI Pack!	Smart Array P800
Disklayout / Raid Sets	10 disks Raid 1+0! provided system discs (logs, archives, sap exe are mounted in the server)	24 disks Raid 1+0! + one disk online spare provided system discs (logs, archives, sap exe are mounted in the server)
Backup / Restore	Data Protector (DP) backup solution	Data Protector (DP) backup solution
Storage characteristic	**A1**	**A2**

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HP Storageworks Enterprise Solution in SAP Environments
EVA 4400, 6100, 8100

EVA is an enterprise class storage array system designed with a powerfully simple interface and the performance you expect from the storage market leader. Its rich set of software capabilities keep your data safe even in the most complex of environments.

Leadership in:

Space

Pooling storage over very large disk groups vs. fractured, small disk groups; snap copies into unallocated space vs. requiring LUNs to be reserved.

Time

Automated disk group & LUN set ups, automated online LUN expansions, automated array tuning, snap clones enable our customers to earn more revenue

Cost

Enables less experienced people to manage the array, frees up higher level professionals to create revenue for the customer, removes the opportunities for human errors.

With EVA, aggregate and automate your array management tasks to manage more storage capacity with fewer resources.

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HP Storageworks Enterprise Solution in SAP Environments Configuration Guide based on EVA

	EVA 4400	EVA 6100	EVA 8100
Entry level configuration:	2C2D 24 * 146/300/400 GB/ 1TB Storage characteristic **B1**		
Medium level configuration:	2C4D 48 (max. 96) * 146 /300/400 GB/ 1 TB Storage characteristic **B2**	2C6D 84 * 146/300 GB/ 1 TB Storage characteristic **C1**	
High level configuration: Recommendation: using two EVA systems connected via Continuous Access (CA) EVA		2C8D 112 * 146/300 GB / 1 TB Storage characteristic **C2**	2C12D 168 * 146/300 GB/ 1 TB Storage characteristic **D1**
Enterprise level configuration: Recommendation: using two EVA systems connected via Continuous Access (CA) EVA			2C18D 240 * 146/300 GB/ 1 TB Storage characteristic **D2**
Storagetools recommendation for Backup & Restore:	• Business Copy (BC) EVA • Data Protector (DP) backup solution • DP ZDB/IR or AppRM for disk-assisted backup/restore • Tape systems incl. Virtual Tape Library	•Business Copy (BC) EVA • Data Protector (DP) backup solution • DP ZDB/IR or AppRM for disk-assisted backup/restore • Tape systems incl. Virtual Tape Library	•Business Copy (BC) EVA • Data Protector (DP) backup solution • DP ZDB/IR or AppRM for disk-assisted backup/restore • Tape systems incl. Virtual Tape Library
Storage High Availability with using a Microsoft Cluster and CA (Two EVAs & Continous Access are required):		Cluster Extension CLX	Cluster Extension CLX

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HP StorageWorks solutions for SAP

- Configuration, qualification and performance guides
  - EVA, EVA iSCSI, XP,
  - MSA, Enterprise File Services Clustered Gateway – available on request – coming public soon
  - Performance sizer XP for SAP – available on request
- Best practices whitepapers
  - SAP ERP on EVA, ProLiant, SQL, Windows
  - SAP ERP and BI on EVA, ProLiant, SQL, Windows
  - SAP ERP and CRM on EVA, Integrity, Oracle, Windows
- External webpages & further information:
  - overview www.hp.com/go/SAP/storage and www.hp.com/go/storage
  - SAP upgrade testing - HP System Copy for SAP brief
  - BC&A business continuity & availability
    - HP Data Protector (DP – incl. ZDB/IR) for SAP and MaxDB whitepaper
    - HP Application Recovery Manager (AppRM) for SAP
    - HP CA EVA for SAP whitepaper – on request
    - Cluster Extension CLX (CA cluster integration for Windows and Linux) / or MetroCluster (CA cluster integration for HP-UX)
    - HP StorageWorks Business Continuity Solutions for SAP brief
  - Consolidation
    - HP Polyserve for SAP on Microsoft SQL - web
    - Consolidation with Storage Essentials including SAP ACC integration – web SAP / HP VIS view
  - SAP BI archiving - HP Reference Information Manager Live Archive for SAP Business Intelligence brief - web
  - HP Adaptive Infrastructure for SAP business whitepaper - web

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HP SAP Landscapes:

Microsoft Netweaver 2004s cluster, mirrored data centers; blade- & VMware solutions

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SAP system landscape proposals

- The following SAP landscape proposals reflect proven solutions that are in widespread use. A large number of environments with ProLiant server (increasingly blade environments) and Enterprise Virtual Storage Arrays have been placed in the market during the last years.

- Detailed technical and pricing (German list price) information on the following configuration examples is available (only for HP SAP partners) via a separate Excel worksheet. As the corresponding infrastructure, such as host bus controllers, FC switches- and cables, rack and accessory are included and separately illustrated, you are able to create individual landscapes for budgeting and method of resolution. The hardware building blocks are separated in rack, server, storage, backup, fibre channel server- and san components.

- The cluster examples are designed for NetWeaver 2004s. What's new in 2004s is that only the critical components of a SAP system are clustered. These are the database and (A)SCS SAP instance (Message and Enqueue). Additionally SAP application servers are required to provide dialog, batch, update, spool and gateway services. It is recommended that the application server is configured as a log on group.

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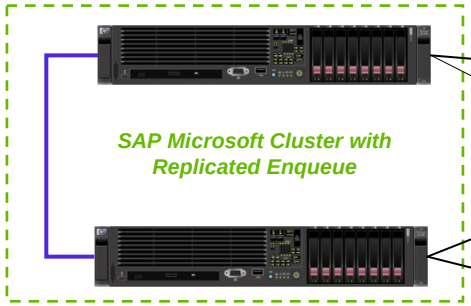
ECC cluster scenario

Note:
- **For more System-; Memory-, or IO performance you should choose to our 4-Socket servers = ProLiant DL580/585G5**
- **HP ProLiant c-class servers could be applied as well**



SAP Microsoft Cluster with Replicated Enqueue

production system - cluster node A+B
constituents: database; ASCS; SCS; application server
2 x ProLiant DL380/DL385G5
- Server char. D or M
- 2 * CPU´s
- 64 GB RAM

test- and qa system
ProLiant DL380/385G5
- Server char. B or K
- 2 * CPU´s
- 16 GB RAM

development system
ProLiant DL380/385G5
- Server char. B or K
- 2 * CPU´s
- 16 GB RAM

SAN Switch

SAN Switch

Fibre channel backup system
MSL6060 tapelibrary
- Two LTO 960 drives
- Dataprotector / AppRM

Fibre Channel Storage System
Enterprise Virtual Array 4400 2C4D
- Storage char. B2
- max. 8 disk shelves = 96 disks
- here 48 x 300 GB fc disks 15k/min
- 2 x HSV300-B fibrechannel controller
- fibre to disk technologie
- operating mode up to 4 Gb
- business copy - unlimited

Disksizing
- production:
  - ~ 1 TB VRAID 1 netto
- test- and qa:
  - ~ 1 TB VRAID 5 netto
- development
  - ~ 200 GB VRAID 5 netto:

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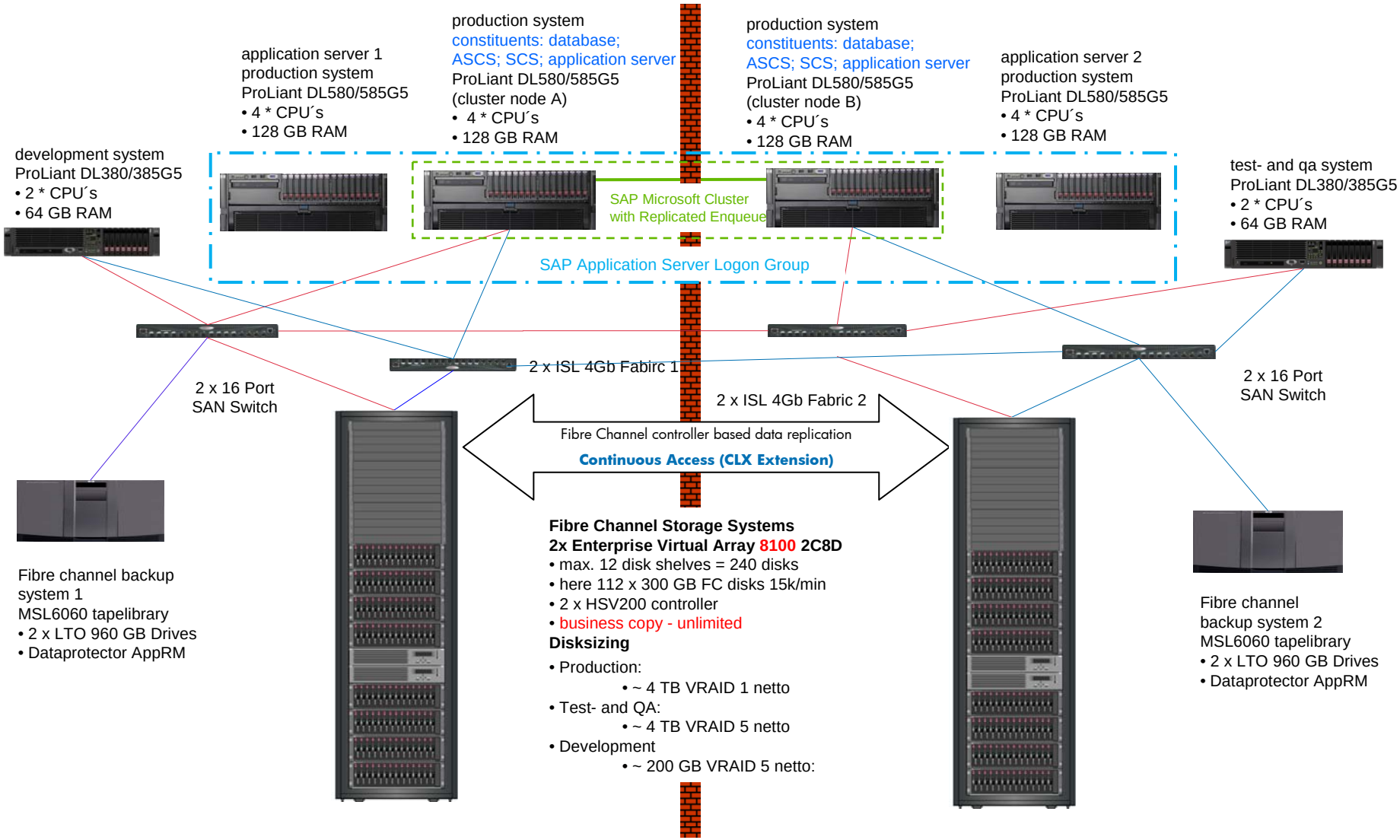
ECC cluster scenario for mirrored data centers



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SAP Applications Landscapes with HP ProLiant Blades

8 x ProLiant BL460/465c

1. R/3 database server production system (cluster node A)
   constituents: database; ASCS; SCS;
   application server
2. R/3 database server production system (cluster node B)
   constituents: database; ASCS; SCS;
   application server
3. R/3 application server 1 production system
4. R/3 application server 2 production system
5. BW database server production system
6. Portal & TRex production server
7. R/3 test- & qa server
8. Universal server / hot spare blade

each blade configured with:
- 2 * Quad Core CPU´s
- 64 GB RAM
- 2 x 146 GB Raid 1 for OS & page file

8 x ProLiant BL460/465c

1. R/3 development server
2. BW development server
3. Portal TRex test-& development server
4. XI production server
5. XI development server
6. Solution manager server
7. Deployment server
8. Backup server

each blade configured with:
- 2 * Quad Core CPU´s
- 32 GB RAM
- 2 x 146 GB Raid 1 for OS & page file

Fibre channel backup system
1 x MSL6060
with 2 x LTO Ultrium 960GB Drives

Fibre Channel Storage System
Enterprise Virtual Array 4400 2C8D

- 2 x HSV300 fibre channel controller
- max. 8 disk shelves = 96 disks
- here 96 x 300 GB fc 15K/min disks
- operating mode 2 Gb, 4 Gb or mixed

Disksizing:
- R/3 production: 2 TB VRAID 1 net
- R/3 test- and qa: 2 TB VRAID 5 net
- R/3 dev: 200 GB VRAID 5 net
- BW production: 2 TB VRAID 1 net
- BW dev: 200 GB VRAID 5 net
- Portal production: 100 GB VRAID 1 net
- Portal test- & dev: 100 GB VRAID 5 net
- XI production: 200 GB VRAID 1 net
- XI test- & dev: 200 GB VRAID 5 net
- Solution manager: 100 GB VRAID 5
- Backup: 100 GB VRAID 5

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Recommended HP Hypervisor SAP Landscapes

Without Virtualization

Classical SAP Landscape

- ECC 6.0 Productionsystem
- ECC Testsystem
- ECC Developmentsystem

- BI Productionsystem
- Bi Developmentsystem

- Portal Productionsystem
- Portal Test- und Devsystem

- CRM Productionsystem
- CRM Test- und Developmentsystem

- XI/PI Productionsystem
- XI/PI Test- & Developmentsystem

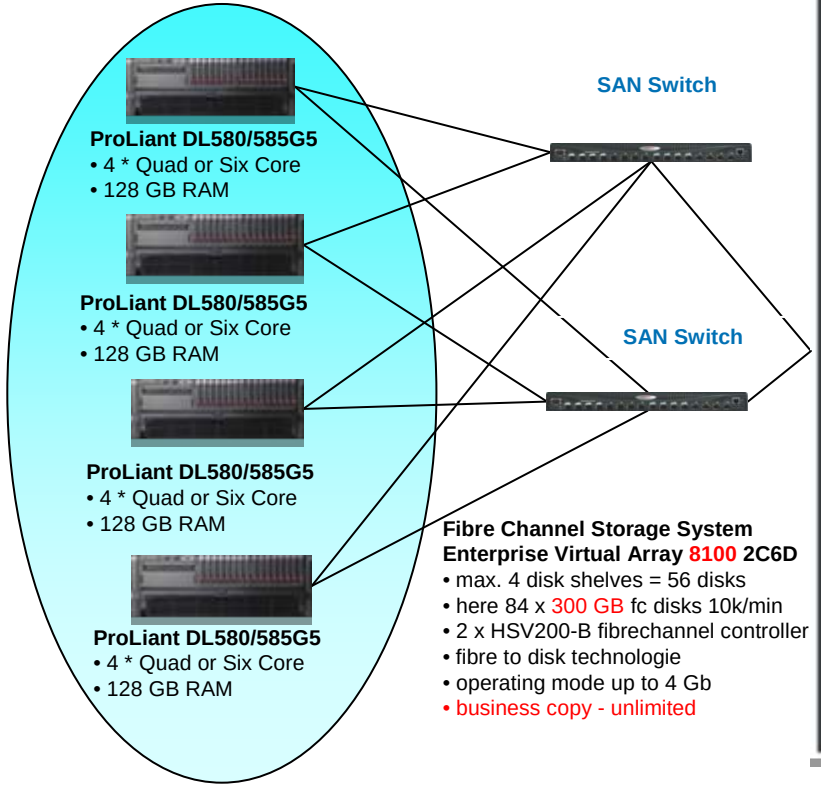
- SAP Solution Manager

- Fileserver
- Printserver
- Exchange Server
- Active Directory Server

= 16 physically Servers

Assumption:
Serverlayout =
DL380; 2 CPU; 16 GB

With Virtualization



Sizing Considerations:

- Depending on customer requirements and landscape size the applicable servers could be 2; 4 or 8-socket servers; respective the corresponding blade servers as well
- To represent flexibility and for transforming the VMware concept the configuration layout; especially for memory and data throughput might in summary map out larger than in physical landscapes; especially in the erection phase. SAP CC recommends starting with a minimum of three pyhsical servers.
- Some more factors:
  - customer requirements to availability, failover performance & desaster tolerance (such as VMware side recovery manager)
  - user behavior
  - the choosen SAP applications
  - distribution of productive- and non productive systems

To assure a successful course of SAP virtalization projects we highly recommend contacting SAP CC!

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