SAP on iSeries
EBCDIC to ASCII Conversion

Global Language Support (GLS)

Agenda

- mySAP.com on iSeries Status & Architecture
- Global Language Support
- Windows 2000 Application Server
- mySAP.com Components
- EBCDIC - ASCII Codepage Conversion
- SAP Sample Configuration
- 2-tier vs. 3-tier

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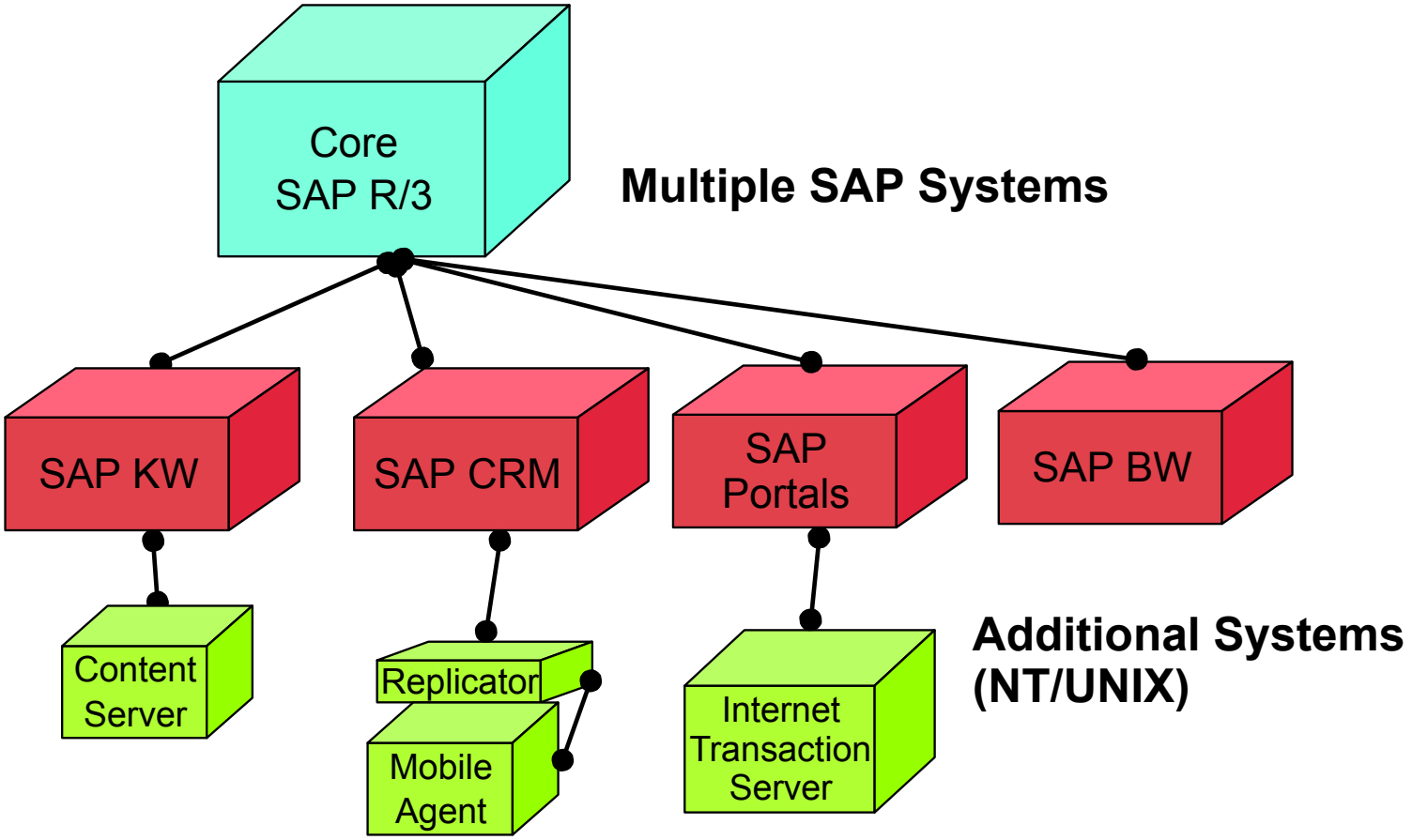
SAP on iSeries

IBM @server iSeries

- 1.Q. 1994: Start of R/3 Porting Project
- 4.Q. 1995: 5 Pilot Customers
- 1.Q. 1996: Controlled Availability (~50 installs)
- July 1996: General Availability , OS/400 V3.6, SAP R/3 Rel. 3.0C,
- Dec. 1996: 170 SAP R/3 on AS/400 installations
- Aug. 1997: AS/400e Series 'Apache'
- Sept. 1998: AS/400e Series 'Northstar'
- Feb. 1999: AS/400e 7xx Models, OS/400 V4R4
- July 1999: SAP R/3 Rel. 4.0B on OS/400 V4R3 certified, R/3 Rel. 4.5B/4.6B on OS/400 V4R4 certified
- May 2000: AS/400e 270, 8xx Models, OS/400 V4R5, R/3 Rel. 4.6C certified
- Oct. 2000: IBM eServer iSeries - 1000th. installation
- March 2001: GLS Version (Global Language Support)
- July 2001: V5R1 certified, New 2tier benchmark : 1325 SD users
- Nov. 2001: More than 1500 Installations inmore than 50 countries worldwide
  Announcement: Win2000 Application Server for iSeries
- Dec. 2001: Only ASCII-Versions for all future SAP Releases

IBM @server iSeries

Complex System Landscape



How is R/3 implemented on iSeries

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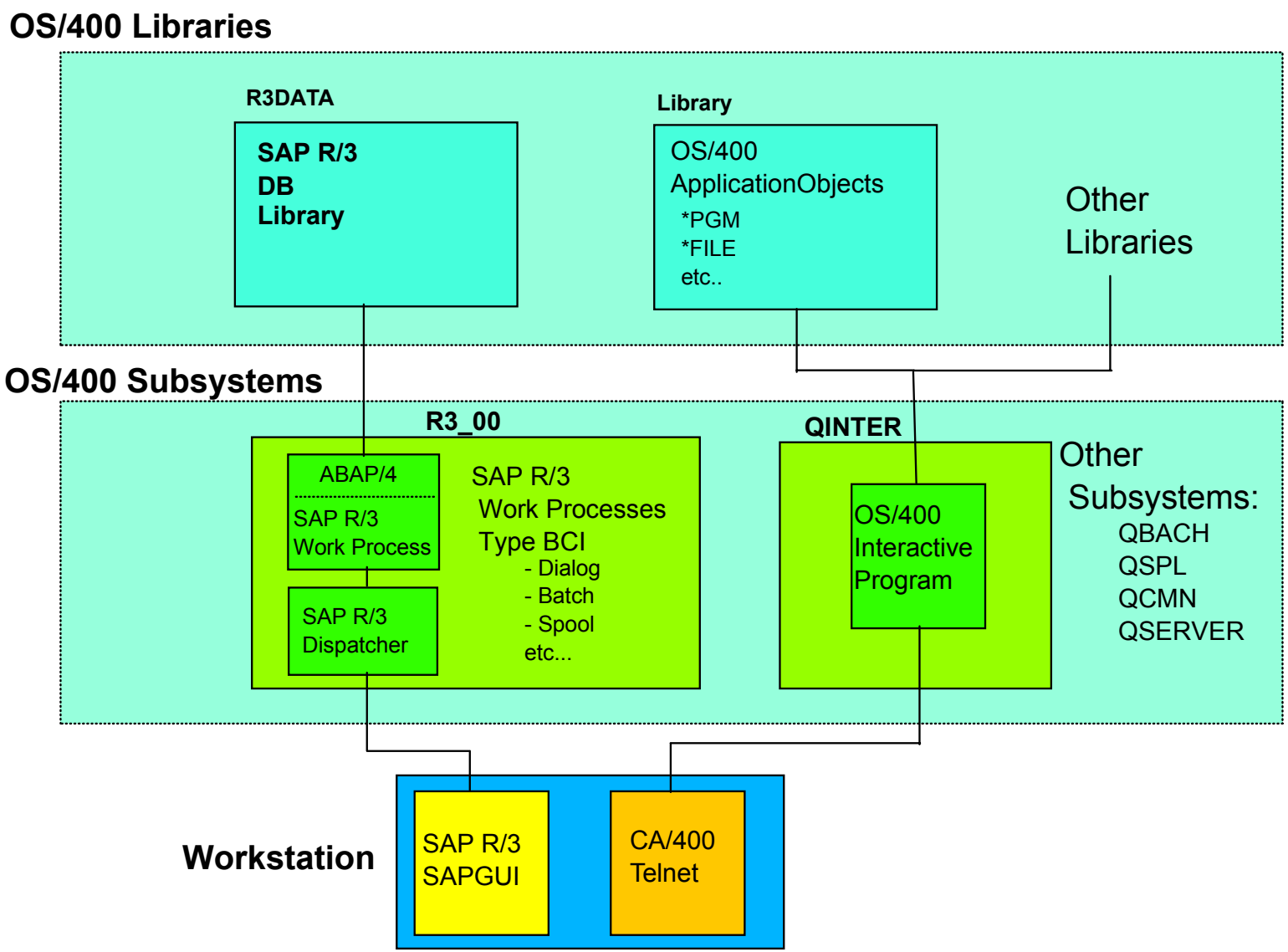

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What is new with the GLS version

- Support of Asian Languages
  - Adds support for English with one of the following languages:
    - Japanese
    - Simplified Chinese
    - Traditional Chinese and Taiwanese
    - Korean
- Capability using multiple languages
  - Mulitple codepages (MDMP)
    - e.g. mix of Western and Eastern European languages
- Support of W2K Application Servers on iSeries Database Servers
  - Price compatitive system landscapes
  - Increased availability of complementary applications

Ways of Encoding

Single Byte Character Set (SBCS)

- Each character is encoded in exactly one byte
- Two standard encoding schemas: ASCII and EBCDIC
- Language specific codepages in each schema (Latin-1, -2, …)

Double Byte Character Set (DBCS)

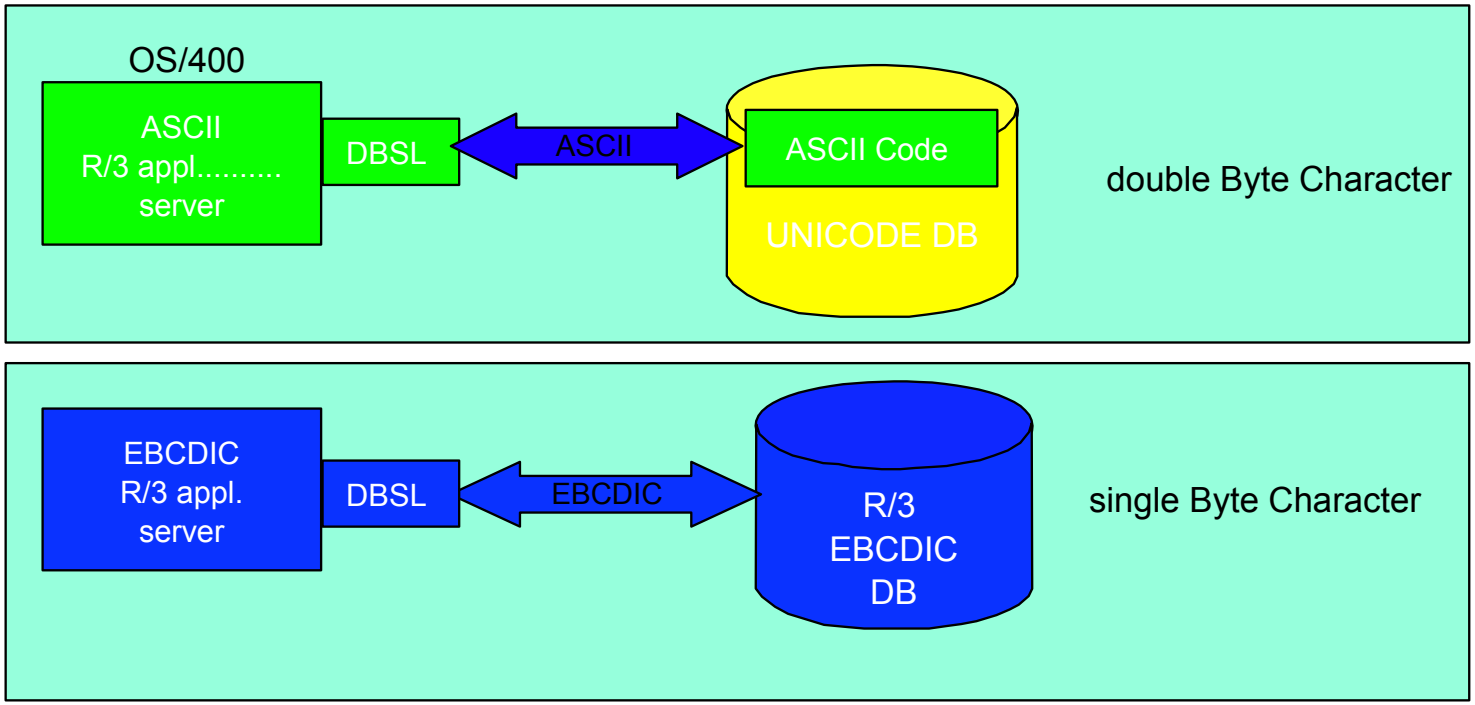
- Each character is encoded in one or two bytes (variable length)
- Numeric characters are encoded in one byte
- Different indication for number of bytes in ASCII and EBCDIC
- Still language specific codepages

IBM @server iSeries

Status December 2001

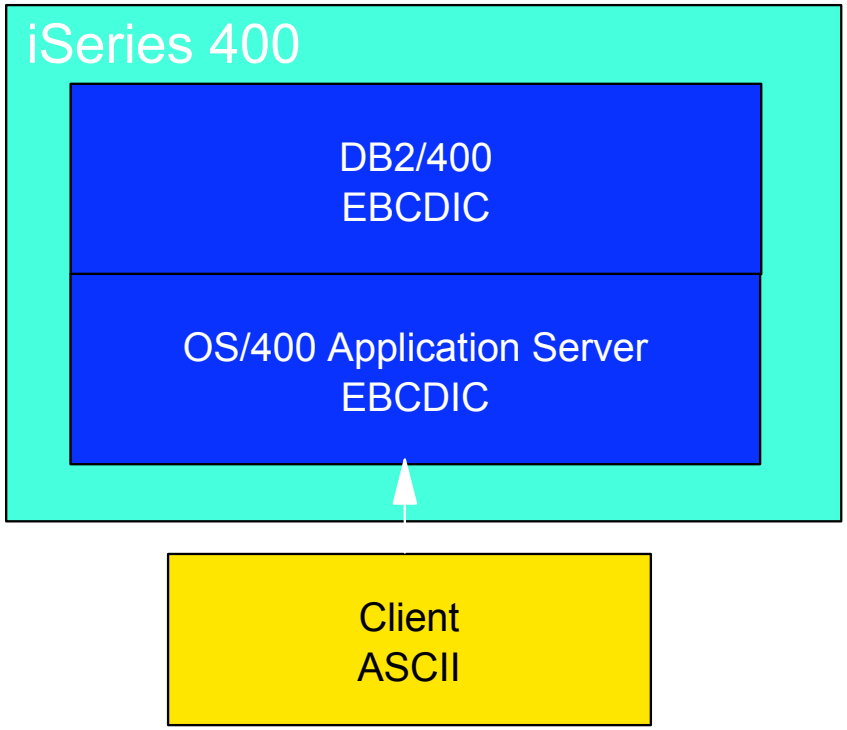
SAP iSeries Customers had 2 options:

- EBCDIC Implementation
- Global Language Support (GLS)



EBCDIC Application Server with EBCDIC DB:

First implementation - EBCDIC only



Features

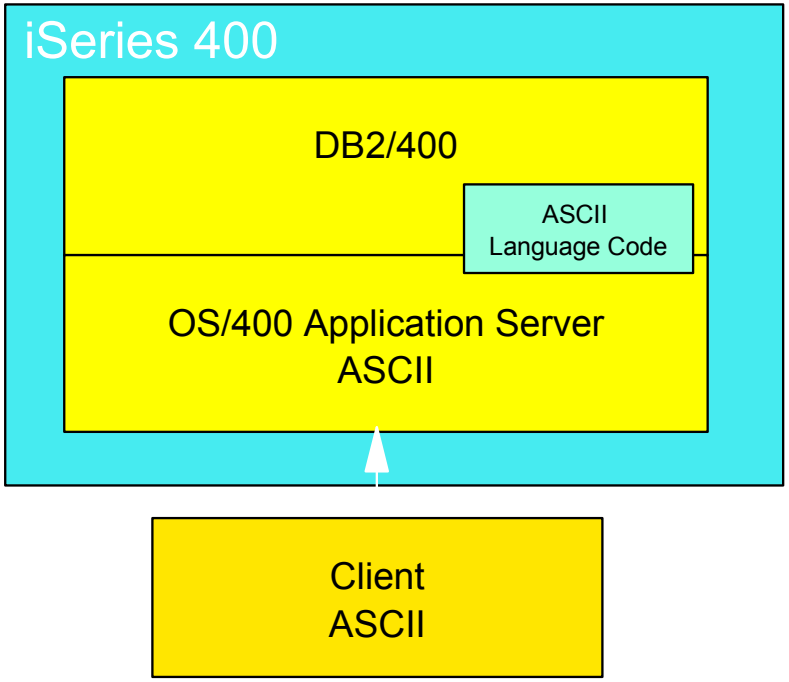
- Single Byte EBCDIC
- Single Codepage supported
- No MDMP
- Homogeneous 3-tier Landscapes (iSeries App-Server)
- No APO on iSeries
- Time to market

GLS Version - Move to Mainstream Technology

IBM @server iSeries

Joint Decision of SAP and IBM

- GLS standard for all future SAP releases on iSeries
- EBCDIC Products will be supported until SAP's end of maintenance dates



Benefits

- Mainstream SAP Technology
- Full 'Global Language Support'
- Price competitive 3-tier landscapes possible with xSeries Application Server
- Improved go to market for new mySAP.com components
- Optimal interoperability with other ASCII systems
- In plan: SAP APO Database Server on iSeries

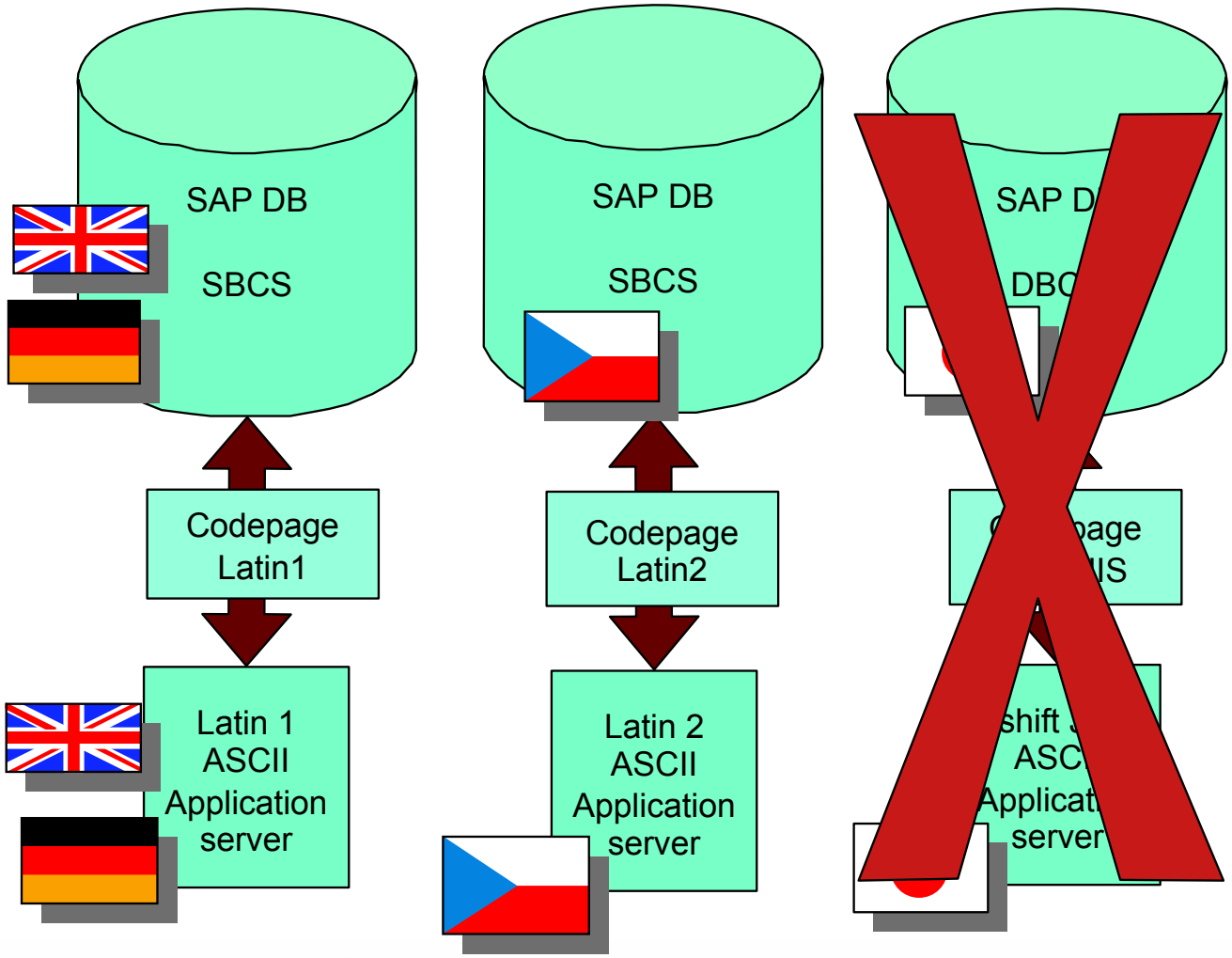
GLS Version Requirements

- Up to 70% additional disk capacity required
  - More Bytes per character
  - No change on disk arm requirements
- 10% more memory
- No change on CPU requirements
- OS/400 V4R5 or higher (OS/400 Option 21 - Extended NLS-Support)
- iSeries PRPQ 5799-AAS (ASCII Run-time Support / ASCII<->EBCDIC Conversion for C-Runtime)
- English as secondary language

Language Support on EBCDIC installation

IBM @server iSeries

- Separate SAP Databases per Codepage
- Defined Character sets per language
- Consistent SAP Database



EBCDIC Version does not support DBCS

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Language Support on ASCII installation using SAP MDMP Concept

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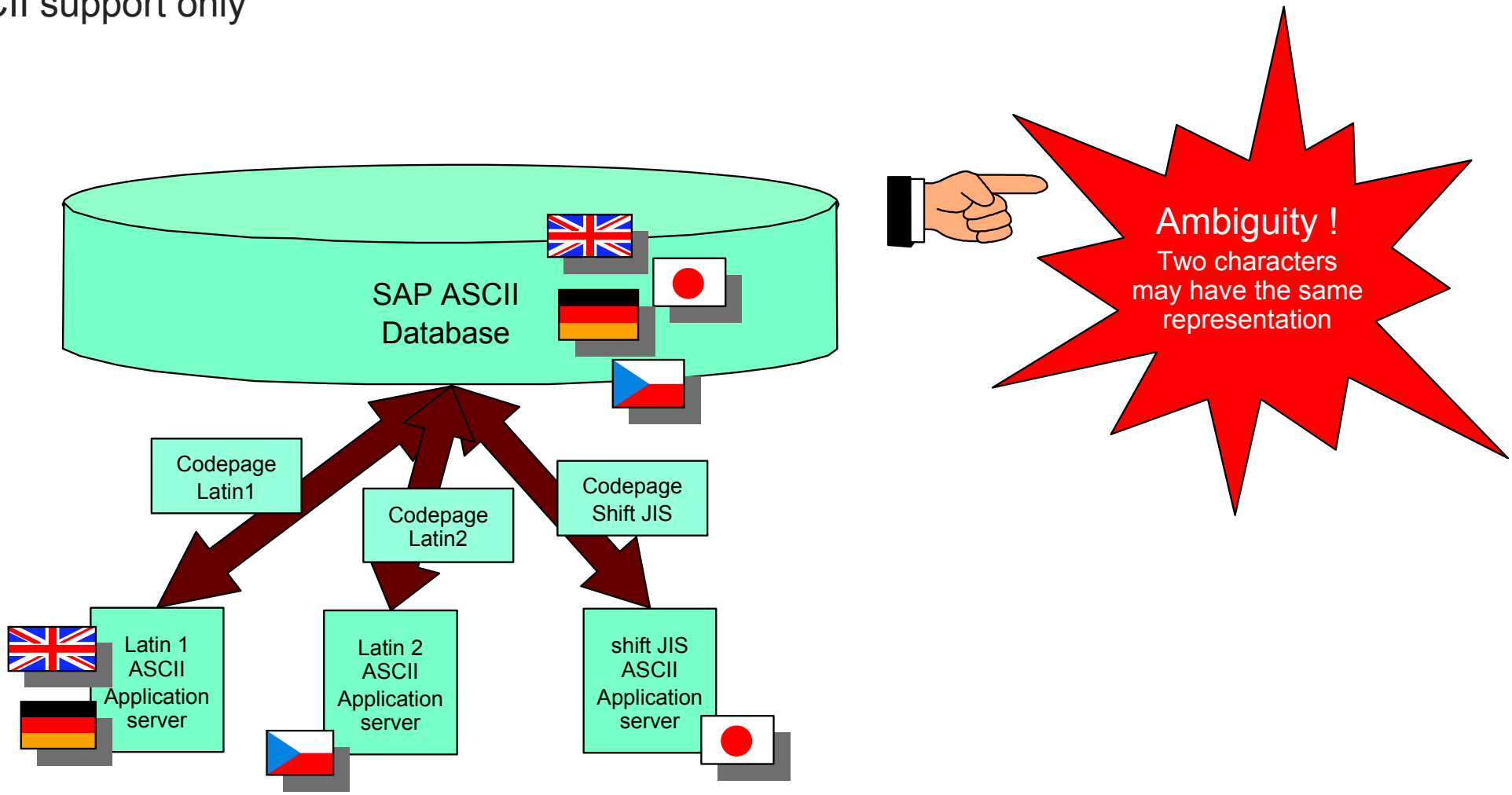
- MDMP: Multi-Display, Multi-Processing
- Multiple languages in same DB
- ASCII support only



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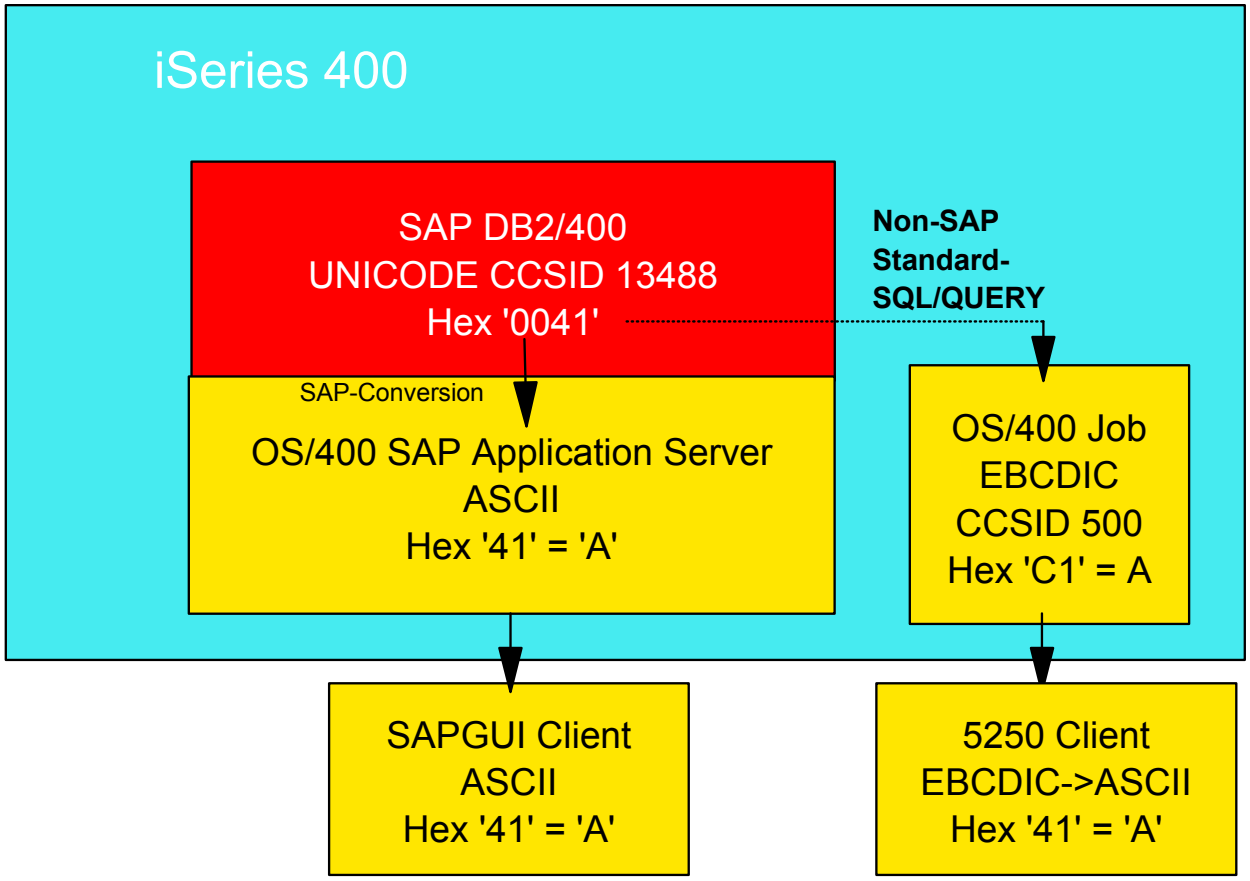
ASCII Application Server and UNICODE DB

Character Conversion



Sample Latin1: 'A'

- **EBCDIC: Hex. C1**
- **ASCII: Hex. 41**
- **In UNICODE DB: Hex. 0041**
  - **First Byte Hex '00'**
  - **Second Byte Hex '41'**

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Windows 2000 ASCII Application Server

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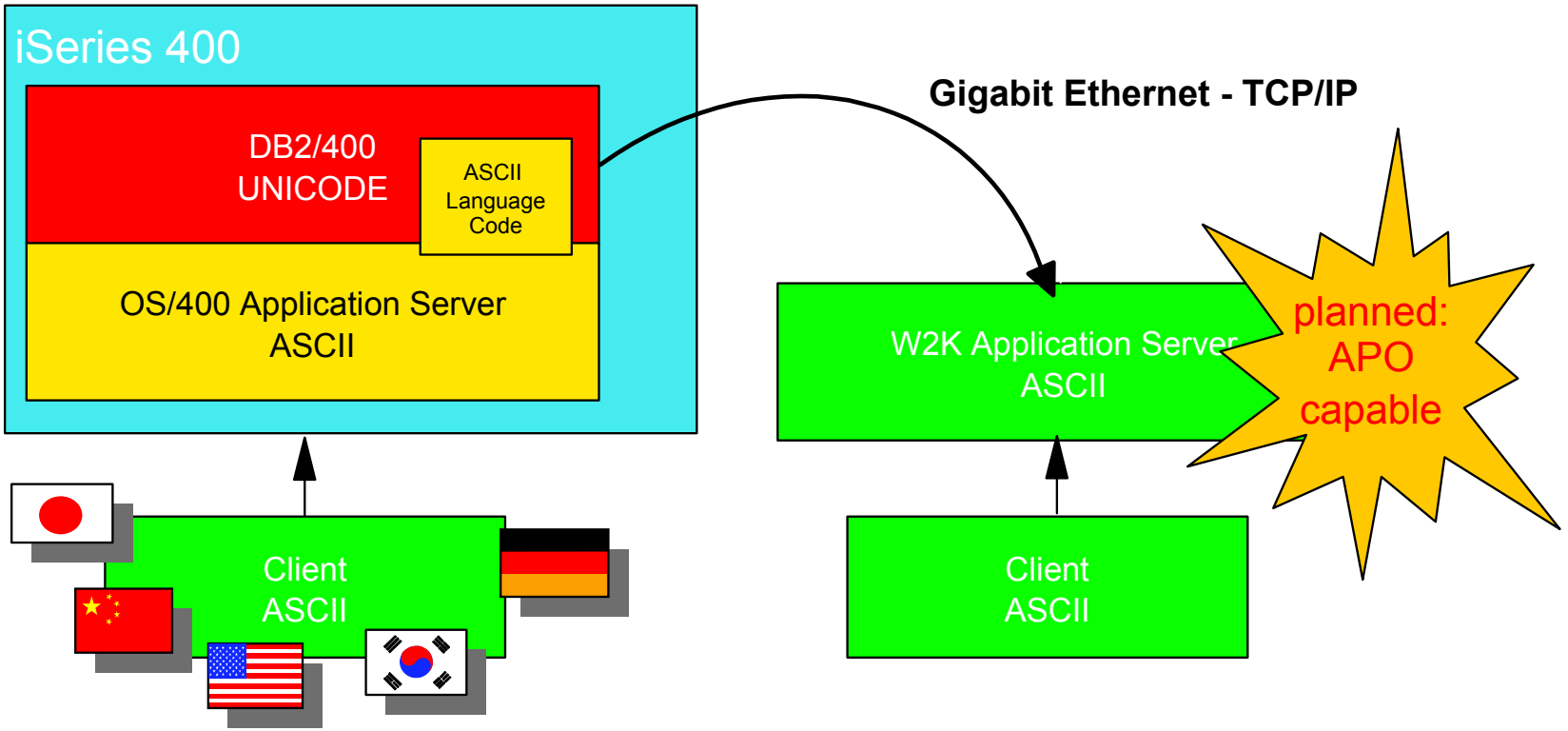
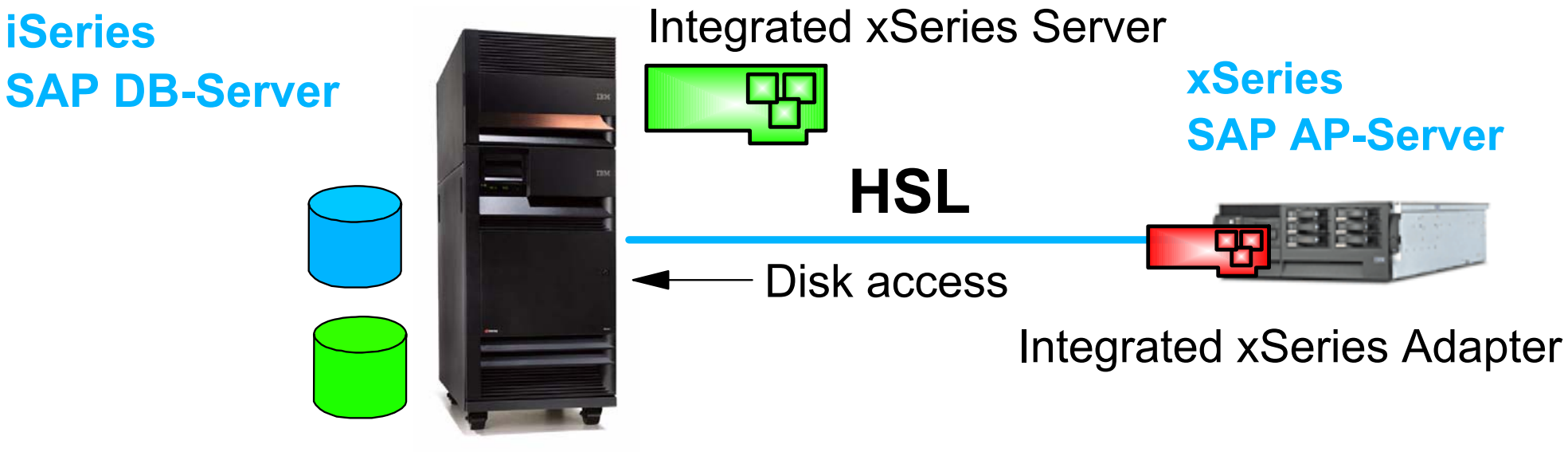


MDMP Support:

Multiple languages in 1 SAP System

Windows 2000 Integration with iSeries (GLS-Version)

IBM @server iSeries



- iSeries-Management of Windows Server and Application
  - **Integrated xSeries Server Intel 850 / 1000 MHz Pentium III**
    - *Single processor*
    - *For smaller environments e.g. Test/Development*
  - **Integrated xSeries Adapter**
    - *xSeries 250 or 350 as Application-Server (7100 or 7600 can be converted/upgraded)*
    - *Connection DB-AP Server: TCP/IP HSL or GB Ethernet*

Windows 2000 Application Server (GLS-Version only)

- **Cost reduced 3-tier configuration with iSeries as Database Serve**
- **Heterogenous Application Server possible**
- **IBM xSeries: Standard xSeries- or iXA- Models**
  - Requires installation of SAP W2K kernel
  - SAP installation handbook available
  - Client Access Express (XDA-Client)
  - Connection: Gigabit Ethernet, HSL for iXA
  - SAP transportsystem etc. on central instance
  - Fast and easy installation

ISICC Demo-Environment

IBM @server iSeries

iSeries

SAP DB-Server and Central Instance on Mod. 270 #2434 2-Way

- Processor #2434, 2-Way
- 3 GB RAM
- 12 x 17.5 GB DASD
- OS/400 V5R1
- SAP 4.6C IDES DB, GLS
- SAP 4.6D Kernel
- Integrated xSeries server

Integrated xSeries Server

- **Windows 2000 Application Server on iXA**
  - Integrated xSeries Server Intel 850 MHz Pentium III, 1 GB RAM
  - Microsoft Windows 2000 Server
  - SAP Windows 2000 4.6D Kernel
  - Connection via internal High Speed TCP/IP Connection
  - IFS on iSeries

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ASCII - EBCDIC

- IBM iSeries (OS/400) is fully enabled for ASCII/EBCDIC
- SAP uses different language implementation

Support matrix

iSeries	SBCS (Single Byte)	DBCS (Double Byte)
ASCII	DB Server (ASCII/UC) Yes App.Server Yes	DB Server (ASCII/UC) Yes App.Server Yes
EBCDIC	App.Server Yes DB Server Yes	Not available

available since 2001

available since 1996

mySAP.com Support Matrix for iSeries

IBM @server iSeries

mySAP components	EBCDIC only	EBCDIC + ASCII	ASCII only	ASCII only
Status	**available**	**available**	**available**	**planned** **(subj. to change)**
WebAS	-	-	6.10	6.20
R/3	4.6B	4.6C	-	4.7 Enterprise
BW	2.0B	2.1B	3.0A	3.x
CRM/EBP	2.0B	2.0C	3.0A	3.x
KM/KW	4.0	5.0/ 5.1/ 5.2	-	(5.3?) 6.x
WP	2.0	2.11 (EBCDIC only)	-	Enterprise Portal Intel-based only
APO	-	-	-	3.10 on 4.6D Kernel

SAP Availability of Products March 2002

	Release	Available/Plan
SAP WebAS	6.10 6.20	11/2001 Q3/2002
SAP R/3-E	"4.7"	Q3/2002
SAP BW	3.0A 3.0B	12.2001 Q2.2002
SAP KW	6.0?	Q3/2002
SAP CRM/EBP	3.0 4.0	12/2001 Q2/2002
SAP APO	3.1	2002 (Pilot)

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Upgrade/Conversion to SAP R/3 4.6 C GLS

SAP R/3 EBCDIC

SAP R/3 GLS

e.g. Release 3.1I

SAP Release Upgrade

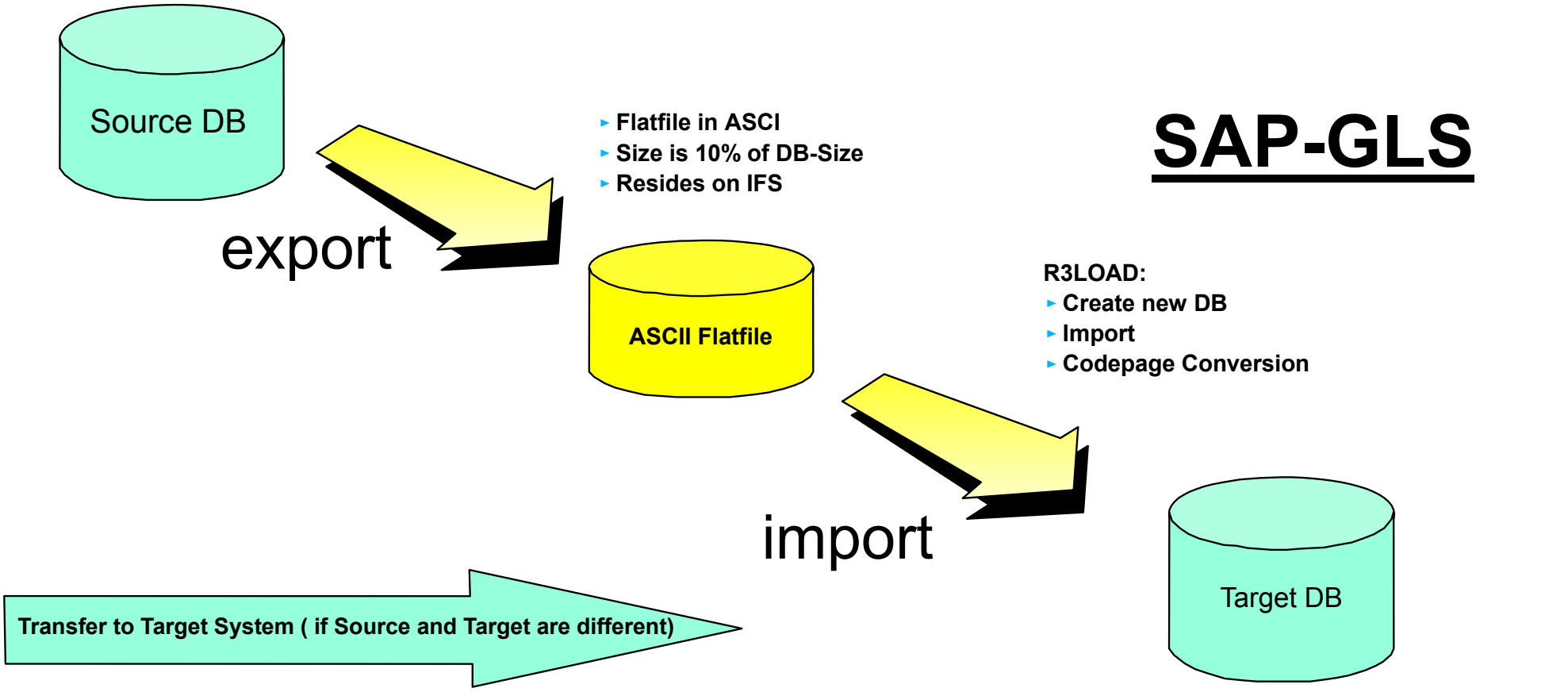
Release 4.6C → EBCDIC-ASCII Codepage Conversion CCSID 500 to CCSID 13488 → Release 4.6C

EBCDIC-ASCII Conversion with Standard Migration Tool

IBM @server iSeries

SAP-EBCDIC

Release 4.6C

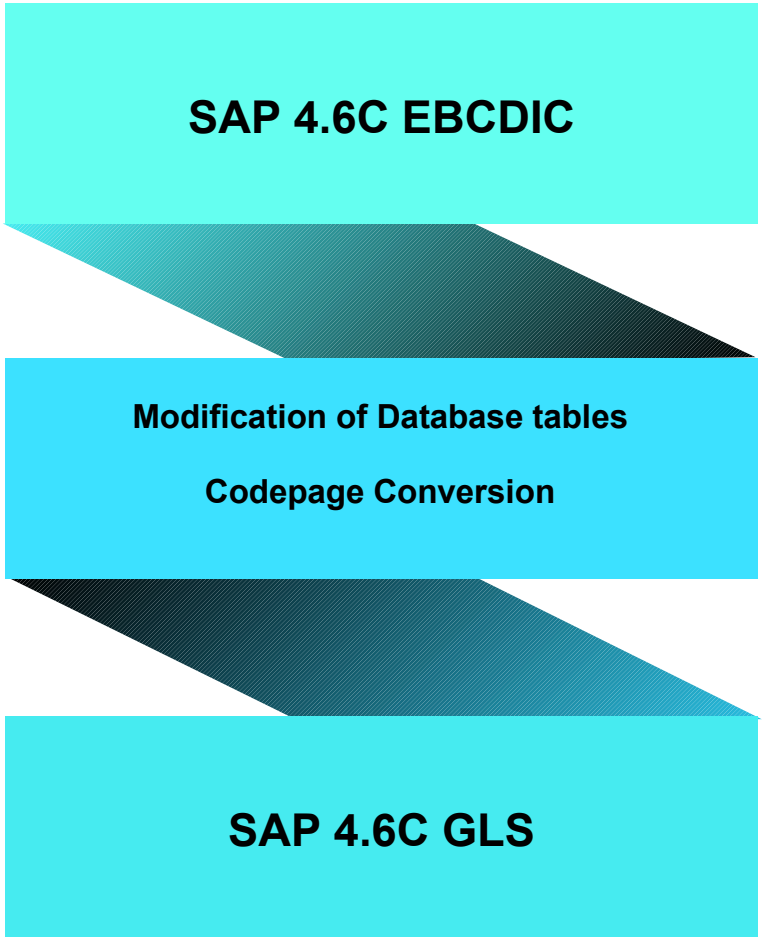


Release 4.6C

SAP Standard Migration Tool

- Works with all Codepages
- Parallel Operations
- Possible to rename SAP system
- Change of ASP's possible
- Requires additional HW-Resources
- Complex to use

EBCDIC-ASCII Inplace Conversion



Background Steps

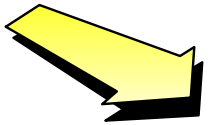
- Modification of existing Database-tables
  - Source and Target are the same
  - Codepage Conversion from 500 to 13488
- Generation of Pool / Cluster files
- Load of Pool and Cluster file data

Faster & Easier

iSeries Inplace Conversion Tool

- For Latin-1 installations
- Inplace codepage exchange in DB
- Up to 3 times faster, especially for larger DBs
- Easy to use
- Requires minimal resources
- Available up on request

iSeries Conversion Tool



Faster and Easier

Important News for Customers

January 2002

- SAP delivers GLS versions only
- Future mySAP.com components GLS only
- New Installs and new customers GLS only

For Existing EBCDIC installations

- Mix of EBCDIC and GLS Version fully supported
- Defined Upgrade/Conversionpath for all installations
- EBCDIC releases will be supported until end of SAP maintenance

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Sample Configuration using a 2-tier or 3-tier Solution

In this example we assume a Quicksizer result of 1.490 SAPS generated by 200 active users

	2-tier	3-tier	
	Central Instance	DB Server	AP Server
830-2403 8-Way	**2071**	18354	3337
820-0151 2-Way	530	**4698**	854
270-2434 2-Way	530	4698	**854**

Configuration 3-tier

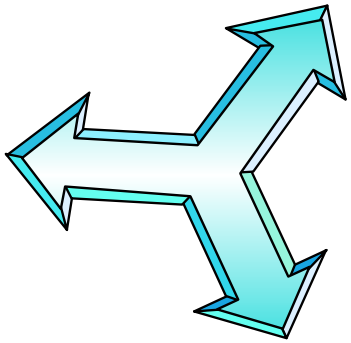
IBM @server iSeries

How to get to a 3-tier configuration
Requirements of 1.490 SAPS

DB-Server (i270 or i820 2-Way)
4698 SAPS DB
854 SAPS Appl.
530 SAPS 2-tier

The App-Server are generating 1490 SAPS on the DB-Servers
= 31%

The capacity left over could be used for a central Instance
= 69% of 530 SAPS = 365 SAPS



745 SAPS Applicaton Server communicating with the DB-Server

745 SAPS Application Server communicating with the DB-Server

Be aware not to use the DB-Server to the extend what is theoretical possible!

Memory-Sizing Formula (IBM)

For iSeries:

2-tier:

- **M = (768 MB + 15 MB * N)*1.2*1.1**
- **Always round up to next 512 MB multiple value**

3-tier:

- **M(DB) = (768 MB + 5 MB * N)*1.2*1.1**
- **M(App) = (768 MB + 13 MB * N(App))*1.2*1.1**
- **Always round up to next 512 MB multiple value**

M	= main memory requirement
M(DB)	= main memory requirement of the database server
M(App)	= main memory requirement of the application server
N(App)	= number of active users per corresponding application server
N	= active users

Memory

- Use the ISICC Architecture & Sizing Guidelines
- Depending on SAP Release

- GLS Version requires additional 10% memory
- Round up to next 512 MB or 1 GB

- Rule of thumb
  - 1.5 - 2 GB / Processor (sStar-Technolgy)

Disk Configuration

- **Disk Configuration**
  - Basis size
  - Customer data
  - Temporary disk
- **ASP-Layout**
  - ASP1 for OS, IFS, Database
  - ASP2 for Journal-Receiver
  - HW-Compression for DEV/QA-Systeme only

Disk Capacity - DB-Server/Central Instance

	EBCDIC	ASCII
Base size (OS+R/3)	25 GB	35 GB
Customer data (Quicksizer)	80 GB	80 x 1.7 GB = 136 GB
Temporary Disk space *	50 GB	50 GB

Example:

Assume a Quicksizer result of 1.490 SAPS generated by 200 active users

* Extended Memory (8-10 GB), Buffer (2-3 GB), SQL-Query Space, workspace for internal Tables

2-tier vs. 3-tier

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2-tier versus 3-tier Sample Configuration

IBM @server iSeries

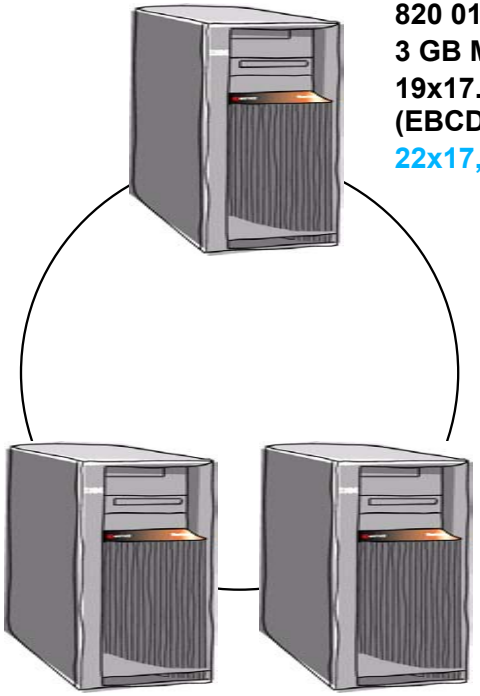
Sample Configuration: approx. 200 active Users, 1490 SAPS

2-tier:

Central Instance:
830 2403, 8-Way
6 GB Memory
19 x 17.5 GB DASD (EBCDIC)
22 x 17.5 GB DASD (ASCII)

3-tier:

DB-Server
820 0151 2-Way
3 GB Memory
19x17.5 GB (EBCDIC)
22x17,5 GB (ASCII)



2 x App-Server
270 2434 2-Way
3 GB Memory
4 x 17,5 GB DASD
or use xSeries 2-Way Pentium III

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2-tier versus 3-tier

2-tier

- Small and midsize installations
- Heterogeneous applications, LPAR concept
- Low administration efforts
- Investment protection
  (upgrade of central systems, integration older server with SPD-technology)

3-tier

- Usage of Base Processor Feature also on larger Installation
  (no interactive CPW needed)
- Lower HW-costs
- Lower costs for High Availability Solution
- Flexible scaling model

3-tier Positioning

- **Central Instance on DB-server**
  - Installation
  - I/O intensive application
- **GigaBit Ethernet for DB AP server connection**
- **HSL with TCP/IP as alternative**
- **Optimal 3-5 application servers per DB server**
- **Flexibility for AP server:**
  - Mix of different HW or SW releases
  - Choice of iSeries and xSeries (only SAP GLS)

3-tier Performance Behavior

- **Better performance in 2-tier, better scalability in 3-tier**
- **Synchronous I/o's via App server are significantly slower**
- **Typical SAP transactions:**
  - 95% of I/o's from buffer
- **Transactions with many I/o's should run on central instance**
  - Batch, Reports, etc.

General statements, valid for all hardware platforms running SAP applications

Additional Information

- Education class on Conversion
- Q&A available
- SAP conversion tool documentation on SAPnet

Description Conversion Class

IBM @server iSeries

Content:

- R/3 on iSeries - EBCDIC and ASCII
- Why Codepage-Conversion to ASCII ?
- Effects of a Codepage Conversion (e.g. special EBCDIC-ASCII-issues)
- SAP Codepage Conversion service
- Requirements for Codepage Conversion
- Codepage Conversion process (Enrolement, project, approval, hardware procurement, remote, access, ...)
- Codepage Conversion tools
- CodepageConversion - preparation
- Demonstration of a Codepage Conversion

Requirements:

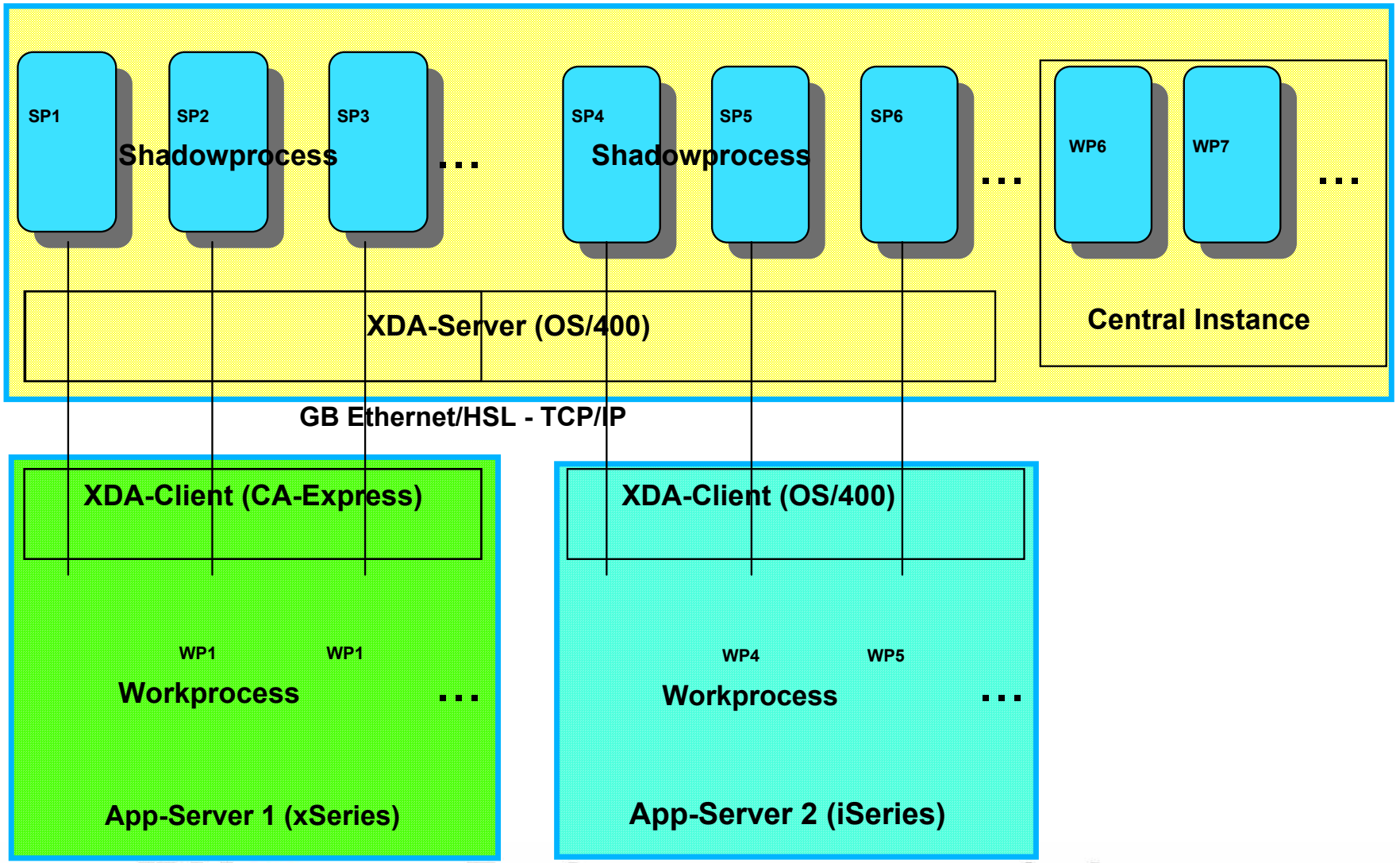
- R/3 base knowledge
- iSeries knowledge (the end of the class contains an "iSeries - examine", that is necessary to pass!)

3-tier Implementation

SAP R/3 Workmanagement

IBM @server iSeries

3-tier Implementation



Questions ?