



SPC203

Integration Between Heterogeneous SAP Unicode and Third Party Systems

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As a result of this workshop, you will be able to:

- **Understand the challenge of communication between SAP Unicode and external third party systems**
- **Understand the architecture of Unicode and non-Unicode in SAP systems**
- **Get the basics of communication between SAP and external Unicode and non-Unicode systems**
- **Get a methodology for interface solutions**
- **See some integration examples**



Introduction and Challenge

Basics of Communication

SAP Connectors and Unicode

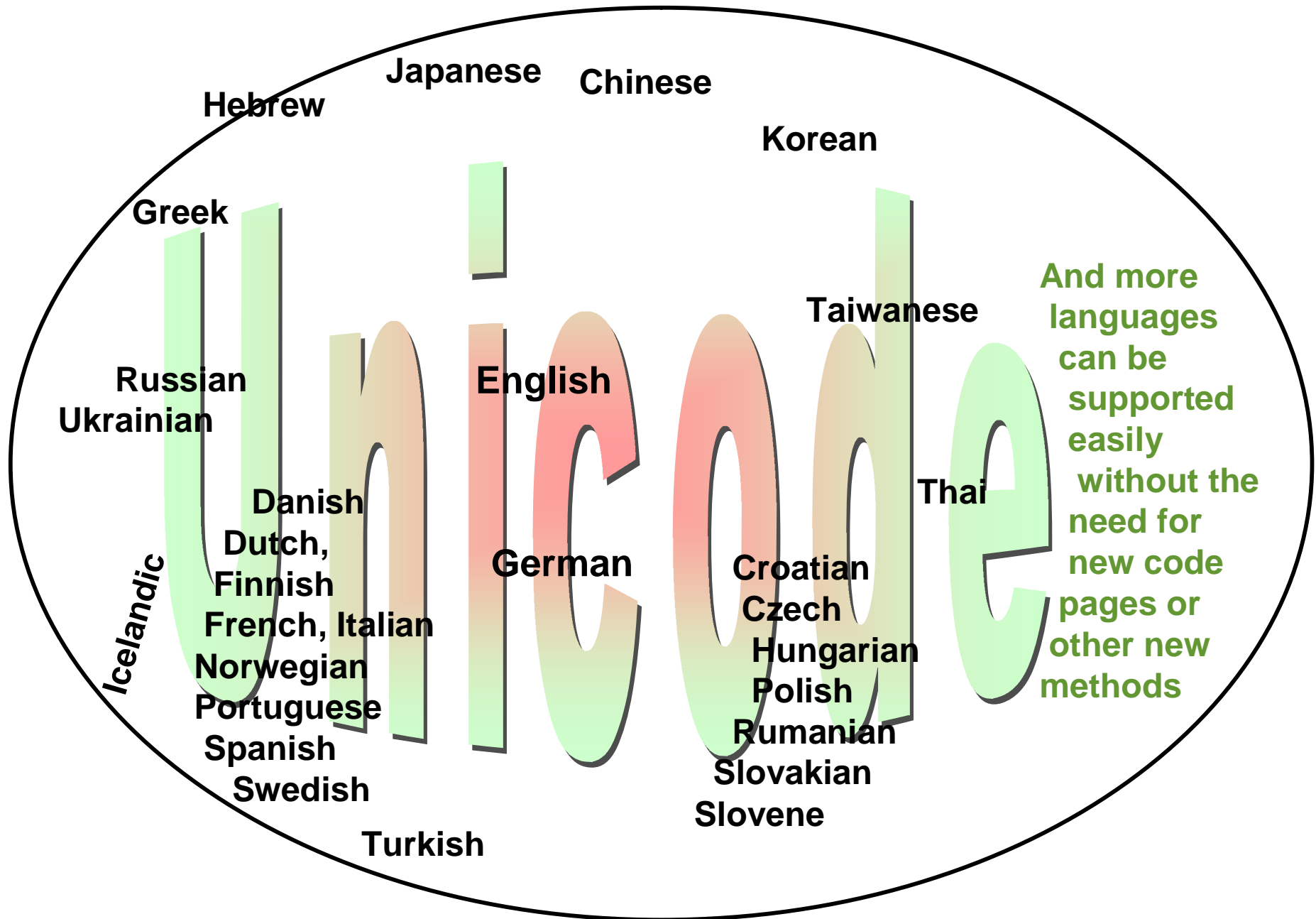
Communication Examples

Who Needs Unicode?

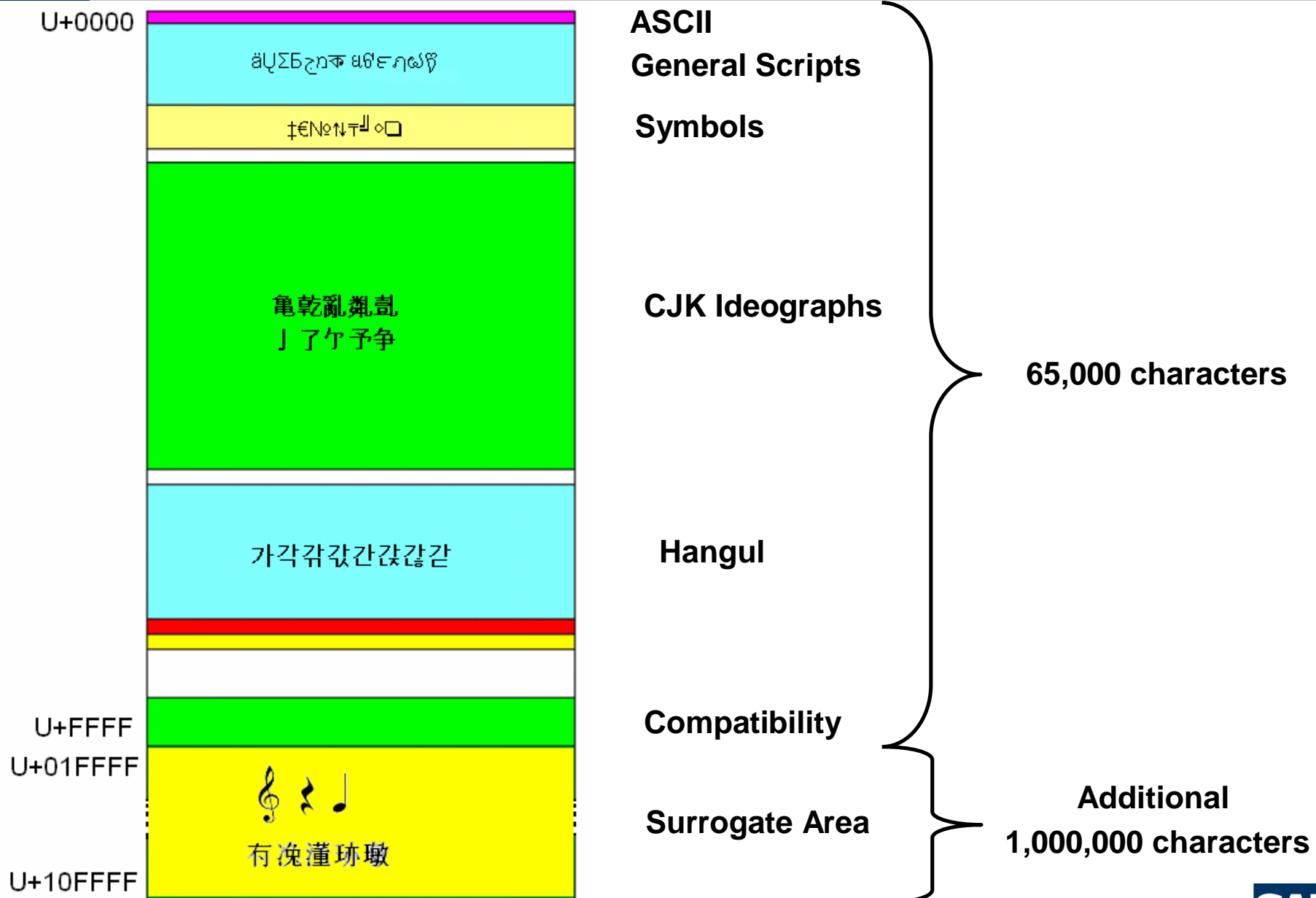
Acting in global business requires support of a Global Character Set!

- **Companies running global business processes like Global HR Systems or Global Master Data Management**
- **Companies offering Web Services to their customers: Global Master Data containing multiple local language characters!**
- **Companies using Open Standards: J2EE and .NET integration (JAVA speaks Unicode only !)**
- **Collaborative Business: Integration of Third Party Products that run on different code pages**

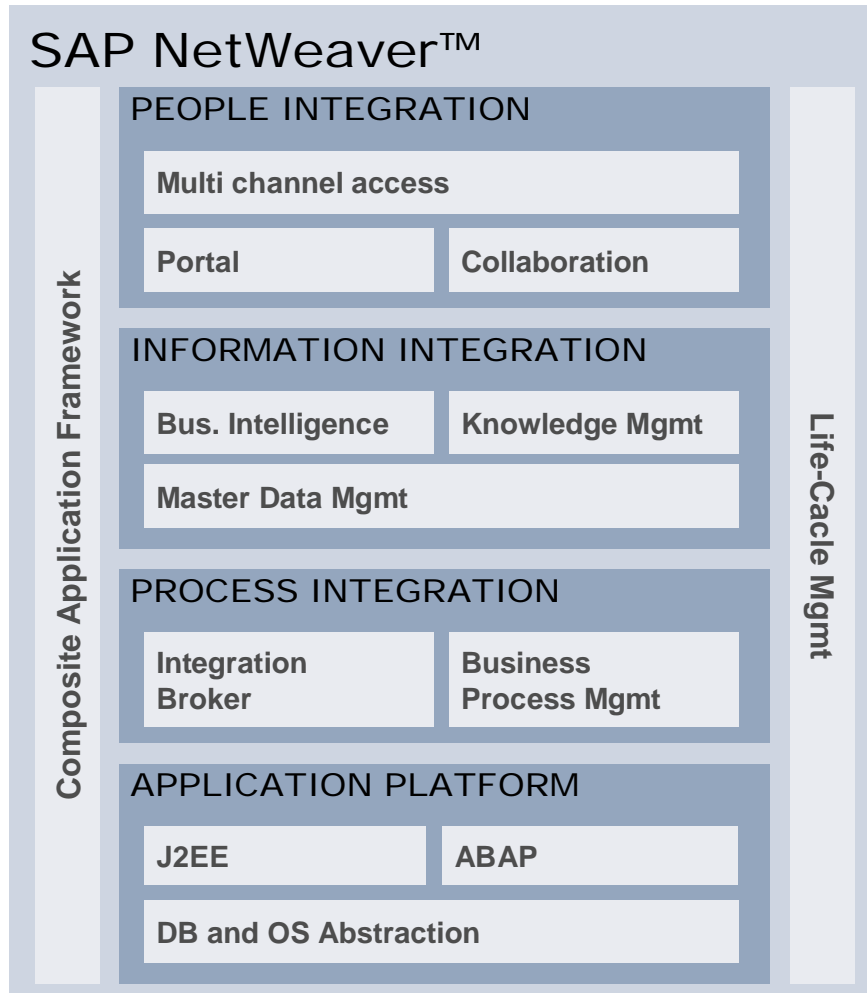
Solution: Unicode, One Code Page For All Scripts



Solution: Unicode Characters



SAP NetWeaver™ The Integration Platform?



Evolution of mySAP Technology

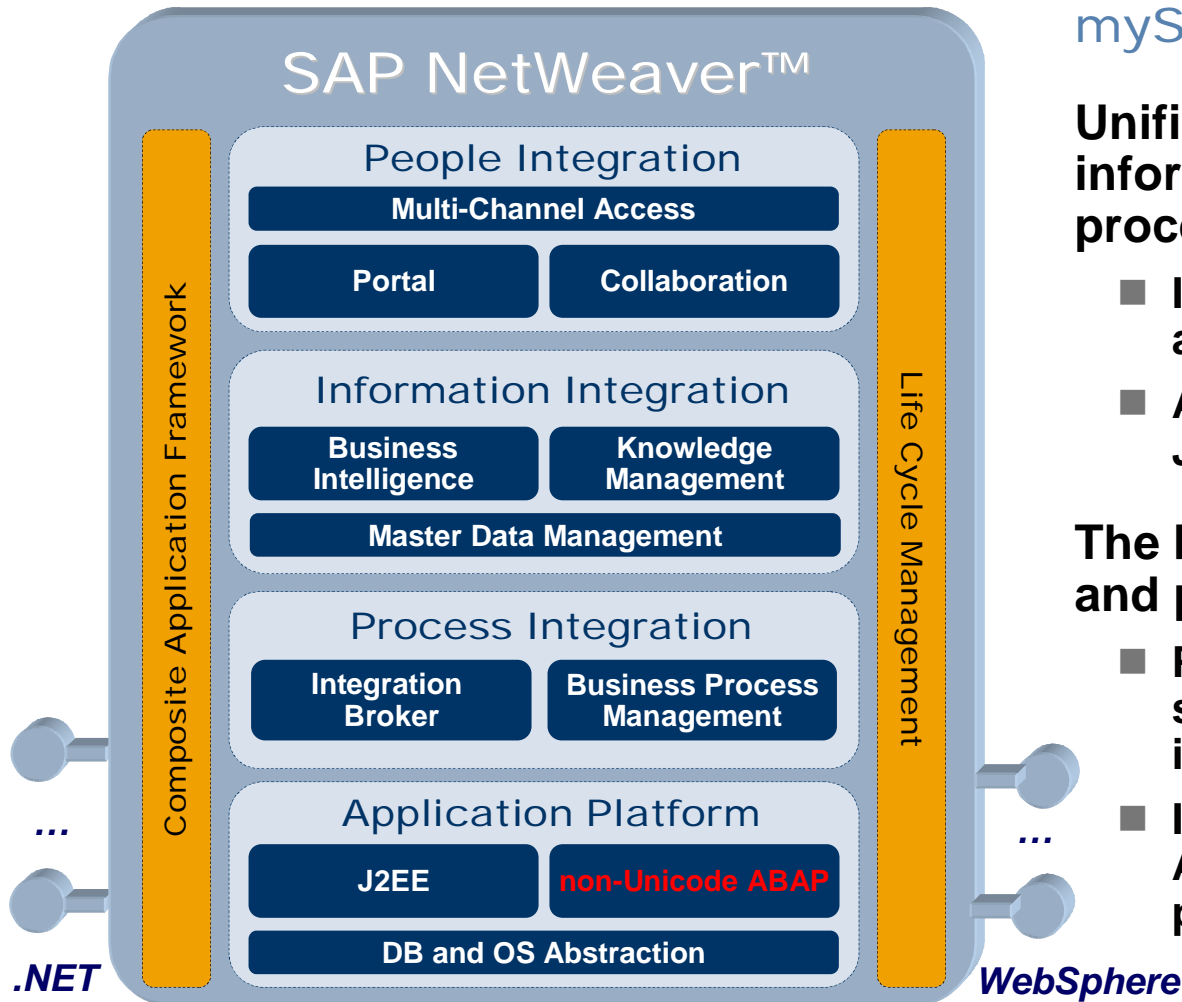
Unifies and aligns people, information and business processes

- Integrates across technologies and organizational boundaries
- A safe choice with full .NET and J2EE interoperability

The business foundation for SAP and partners

- Powers business-ready solutions that reduce custom integration
- Its Enterprise Services Architecture increases business process flexibility

SAP NetWeaver™ With Non-Unicode ABAP Stack Limited



Evolution of mySAP Technology

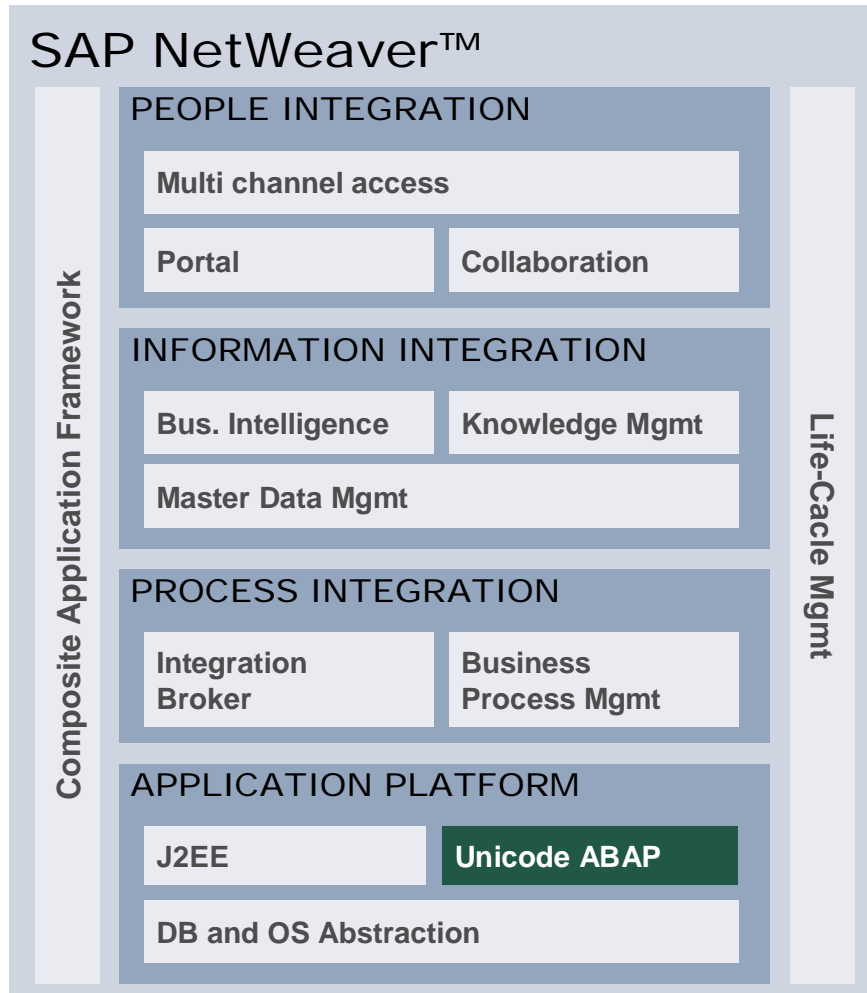
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Only Solution For Full Integration With Unicode



Evolution of mySAP Technology

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- Integrates across technologies and organizational boundaries
- A safe choice with full .NET and J2EE interoperability

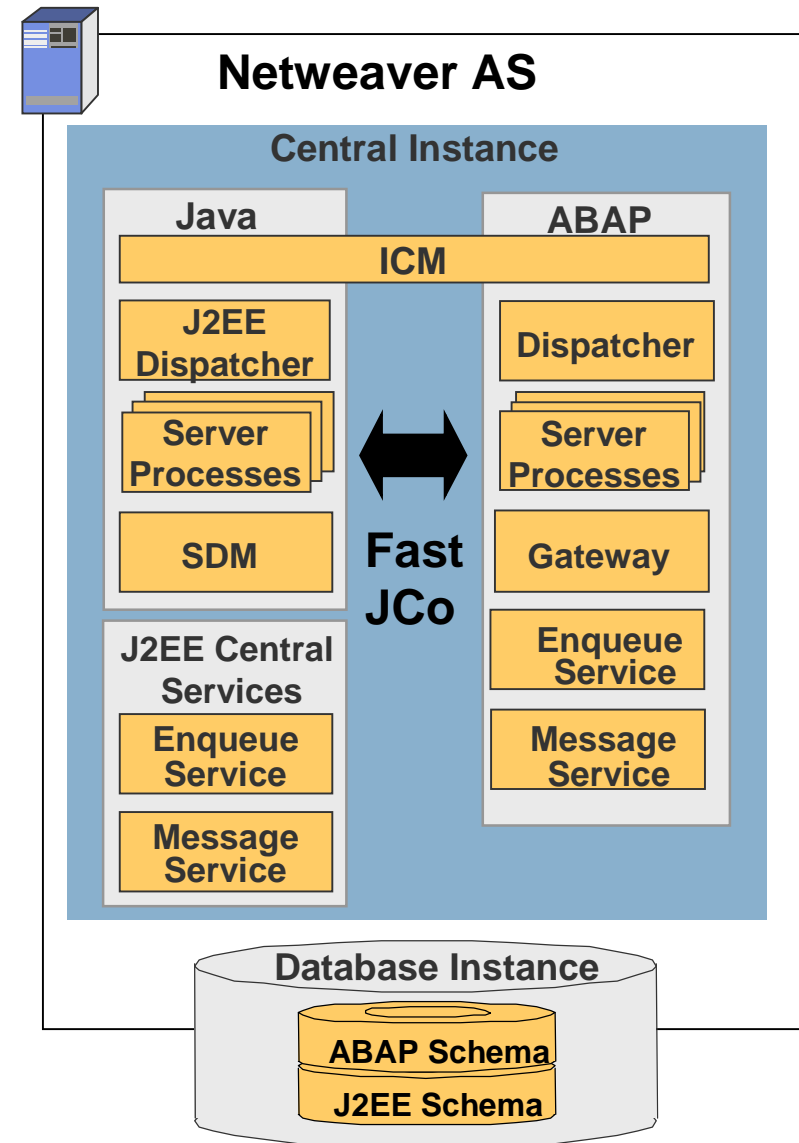
The business foundation for SAP and partners

- Powers business-ready solutions that reduce custom integration
- Its Enterprise Services Architecture increases business process flexibility

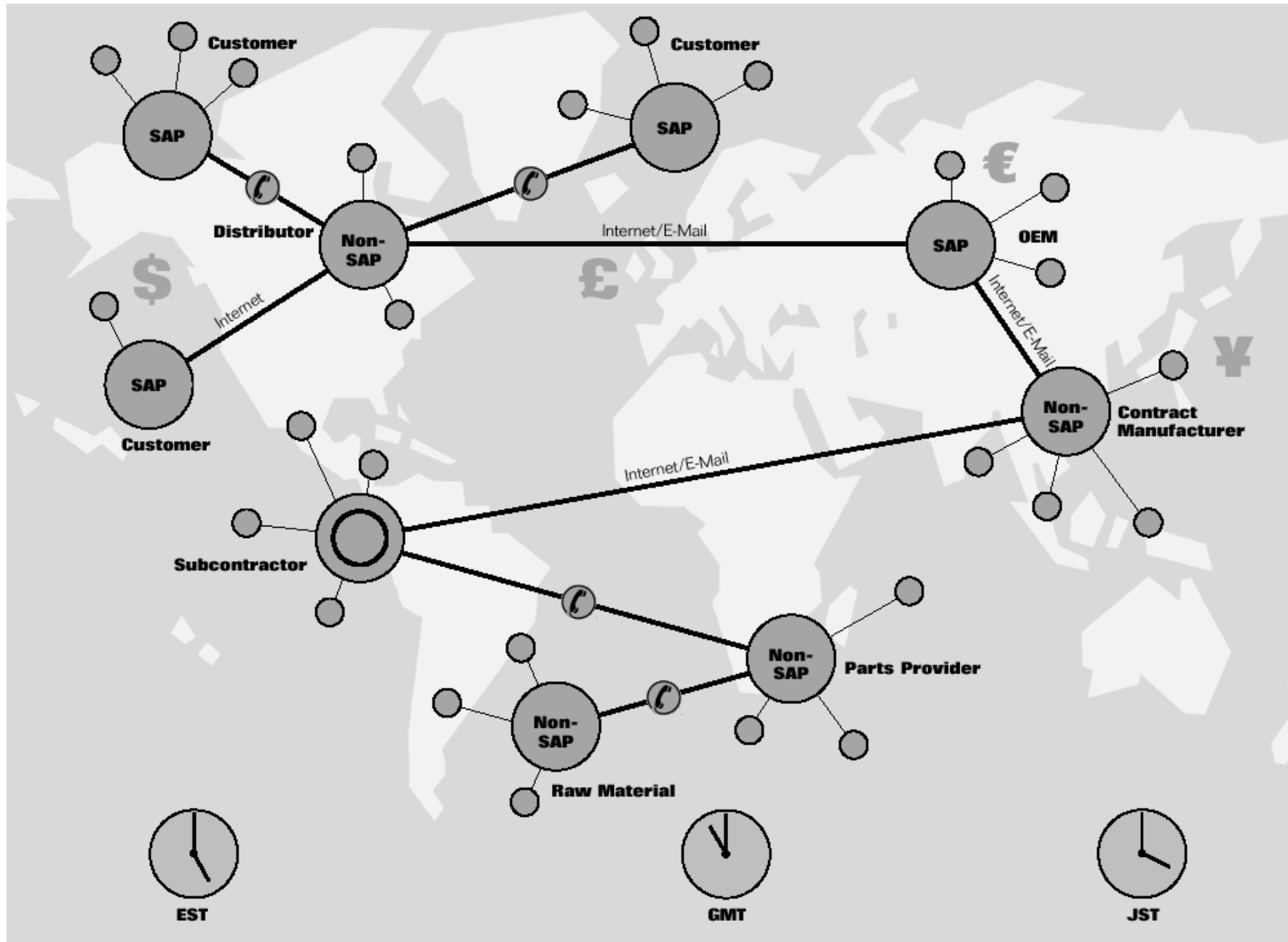
Netweaver Application Server With ABAP And JAVA Stack

Impact of Combined ABAP and JAVA Stack instance on language architecture:

- ABAP and JAVA stack running on one instance
- Common Database, different ABAP and J2EE table schema
- Communication between ABAP and JAVA through fast JAVA connector (JCo)
- JAVA runs on Unicode only
- If ABAP stack runs in non-Unicode conversion from/to Unicode and non-Unicode required! Can lead to data loss!
- Full language data consistency only with both ABAP and JAVA stack in Unicode



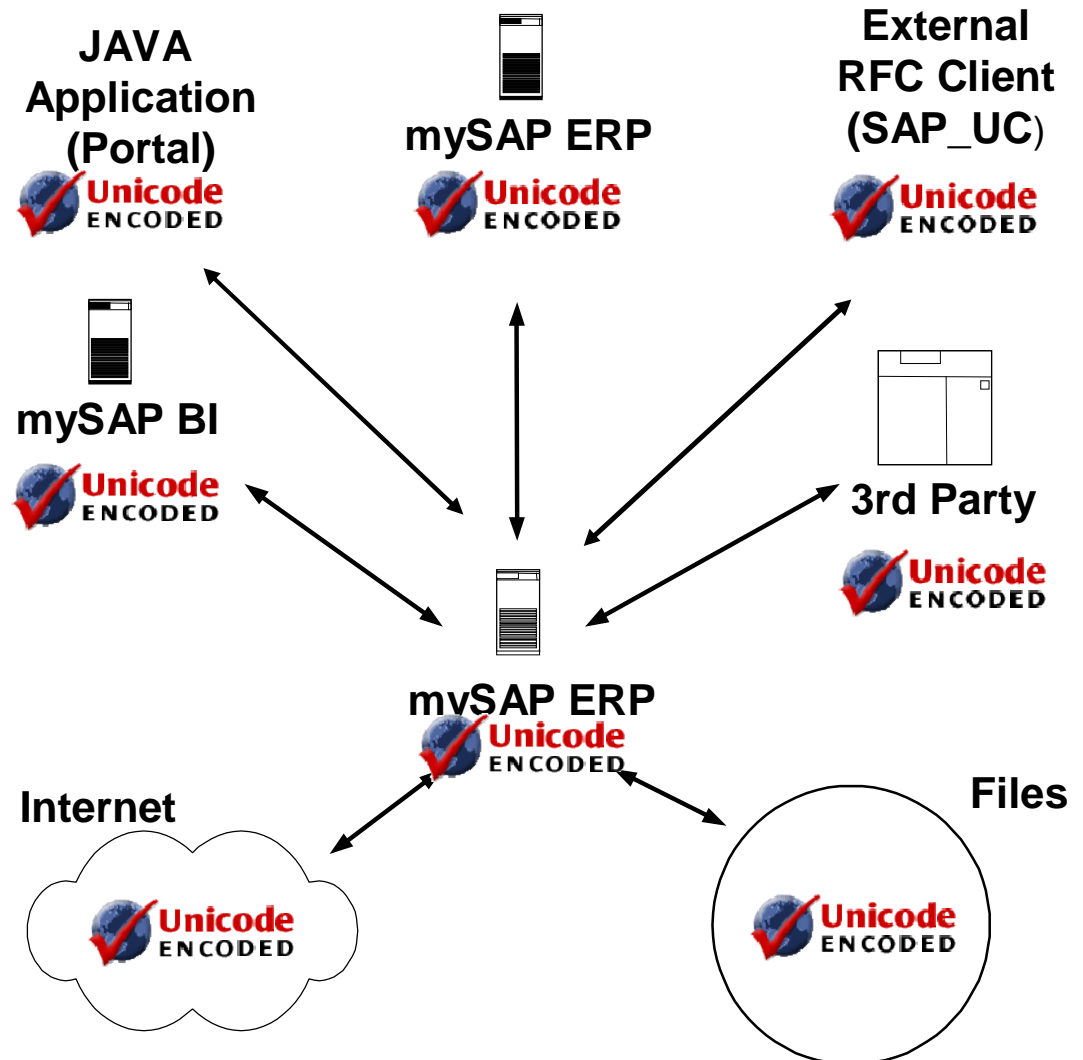
Open Integration And Connection SAP/non-SAP Everywhere



Communication: The Ideal Picture

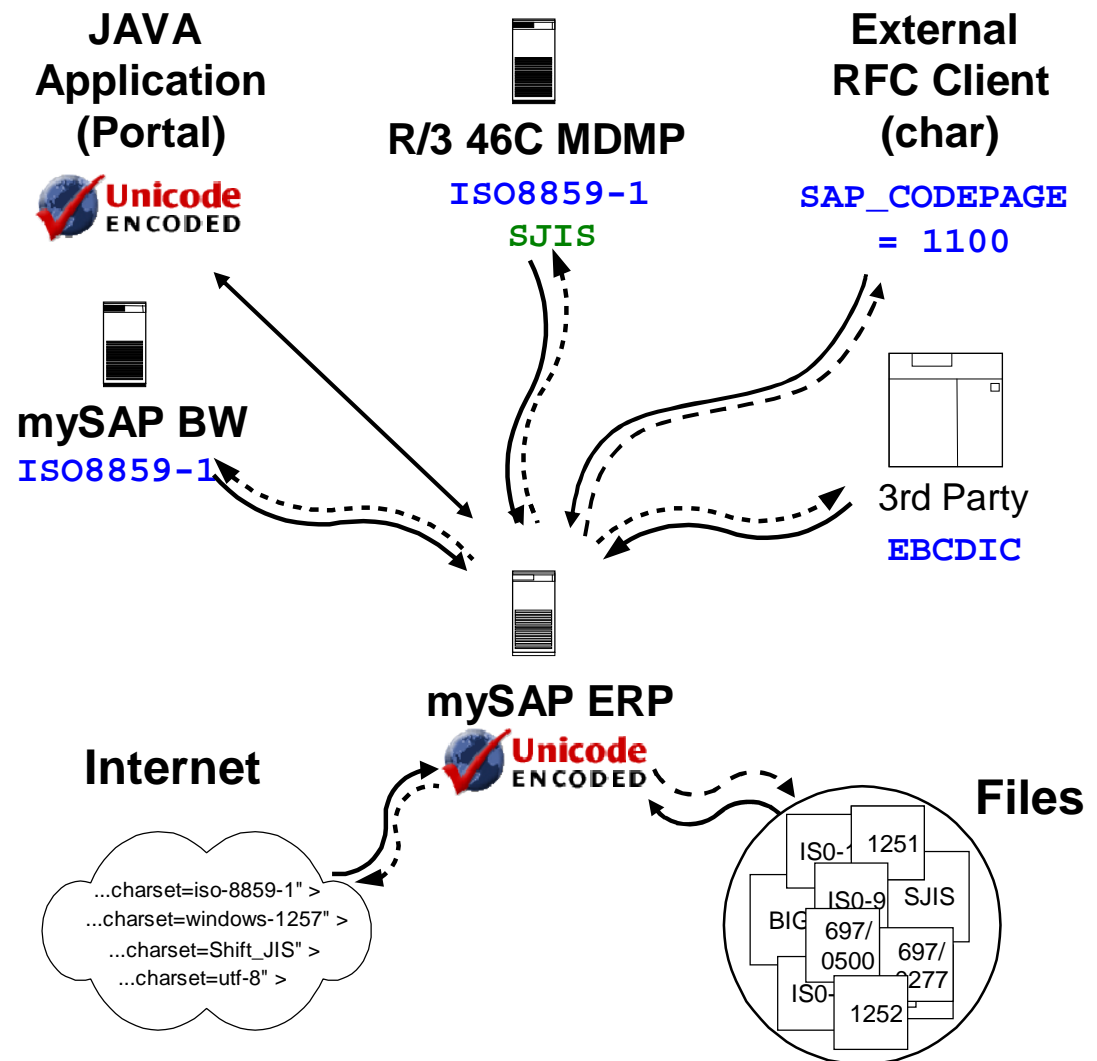
The ideal Picture: only Unicode components

- **Ideal: Large IT system landscape with Unicode systems only**
- **Conversions are done algorithmically (1:1 relation)**
- **No data misinterpretation**
- **No data loss**
- **All business relevant characters available at the same time**
- ...



The reality: Unicode and non-Unicode components

- Large IT landscape with mixed SAP and non-SAP systems
- Typical Unicode and non-Unicode systems
- Systems with old releases
- Conversions between incompatible code pages everywhere
- Only common subset exchangeable
- Special rules have to be obeyed to make communication possible
- ...



The main interface challenges

- **Many SAP systems in Unicode and non-Unicode Single Codepage and MDMP exist**
- **Many interfaces to non-SAP systems exist**
- **No or incomplete list of all main interfaces is available, no or incomplete information which interfaces exchange business text data in which languages**
- **Even if it is planned to convert all SAP systems to Unicode, it is mostly only possible to convert one SAP system only at one time**
- **During an Unicode conversion the effort for interface testing and adjustment is often underestimated**
- **Partner systems or their interfaces to SAP are often old, sometimes even no more supported. When re-connecting such an interface to an Unicode converted SAP system, often even technical connections are no more possible**
- **If add-on software or non-SAP interface is not Unicode enabled an early discussion with and solution from vendor is required**

Complete lists of all interfaces required for efficient work

- **Interface list for SAP – SAP system connections**
 - **SAP Component / Release / Support Package**
 - **Additional installed software, add-ons, IS-solutions, etc. and information if Unicode enabled**
 - **Codepage and language configuration**
 - **Interface language critical yes/no – which languages exchanged**

- **Interface list for critical non-SAP system connections**
 - **Name and vendor of interface**
 - **Technical information about interface**
 - **Codepage and Unicode information**
 - **Interface language critical yes/no**

Example List of SAP – SAP Interfaces at a Customer

SAP Component	Release	SP Level	Code Page	Comment
R/3	4.7x110	39 / 20 / 28	Unicode	
SAPGUI	6.20 / 6.40	> 40 / ...	All	6.40 for Asia required
SRM	3.0	40 / 5	1100	
R/3	4.7 x 110	28 / 14 / 17	1100	
BW	3.1	(missing)	1100	
SEM	3.5	(missing)	1100	With BW
APO	3.0		1100	
CRM	4.0		Unicode	Unicode since 10/03
EP	6.0	SP2	Unicode	

Issue: SAP Unicode – Unicode and Unicode – Single Codepage Communication

Example List of SAP – non-SAP Interfaces at a Customer

Adapter / Product/ Component	Version	Language critical = X ? = unknown, - = unlikely
WEBMETHODS / SAP JCo	6.1 / 2.1.3	X
Websphere Application Server	5.0.2	X
MS Active Directory Server	AD2003	-
Vignette (Portal)	7.3	X
IBM WEB Server	1.3.29	X
Lotus QuickPlace	...	?
Global Passport (GP)	...	Supports LATIN-1 only Language Requirements unclear
Critical Interfaces, since not Unicode compliant:		
Readsoft Datamail Scanner	...	Not UC compliant , check with (vendor)
BMC	...	Not UC compliant check/discuss with (vendor)

- Issue: Most interfaces language critical

- Issue: 2 interfaces not Unicode compliant, action needed



Introduction and Challenge

Basics of Communication

SAP Connectors and Unicode

Communication Examples

Communication Technology to/from SAP Systems (1)

- **RFC is the most used technology for the connection with SAP systems.**
- **SAP Unicode – Unicode or SAP non-Unicode – non-Unicode connections are called “homogenous”, mixed connections SAP Unicode – non-Unicode or vice versa are called “inhomogeneous”.**
- **RFC automatically converts between Unicode and non-Unicode, in case of an inhomogeneous connection always on the Unicode system.**
- **For the Unicode – non-Unicode single codepage conversion a communication codepage (connection codepage) is determined during the connection, which is determined according to several rules.**
- **A special RFC function is available between a SAP Unicode – SAP MDMP ABAP based connection only , which, however, requires special interface development in most scenarios. In all other cases one separate connection (“channel”) per codepage between a non-ABAP Unicode and SAP MDMP system is needed.**

- **The communication between SAP and non-SAP systems is often done through special connectors and adapters which have been developed by SAP or partners for the dedicated connection. The connectors are often using the RFC technology with basically the same conversion rules as SAP-SAP in case of an inhomogeneous connection between Unicode and non-Unicode. The connectors usually support Unicode and single codepage partners, however supported versions and newest patch levels are required.**
- **The proper RFC Unicode related settings for a SAP – non-SAP connection (SAP caller, non-SAP caller) are crucial and should be analyzed and checked carefully.**
- **If an external RFC client /server program (e.g. written in C or C++) is used, it should be clarified if it shall support single code page only or Unicode. In case of Unicode support the external C-program must be adjusted for Unicode.**

Representation of Unicode Characters

UTF-16 – Unicode Transformation Format, 16 bit encoding

- Fixed length, 1 character = 2 bytes (surrogate pairs = 2 + 2 bytes)
- Platform-dependent byte order (big/little endian)
- 2 byte alignment restriction

UTF-8 – Unicode Transformation Format, 8 bit encoding

- Variable length, 1 character = 1...4 bytes
- Platform independent
- no alignment restriction
- 7 bit US ASCII compatible

Character	Unicode scalar value	UTF-16 big endian	UTF-16 little endian	UTF-8
a	U+0061	00 61	61 00	61
ä	U+00E4	00 E4	E4 00	C3 A4
α	U+03B1	03 B1	B1 03	CE B1
會	U+3479	34 79	79 34	E3 91 B9

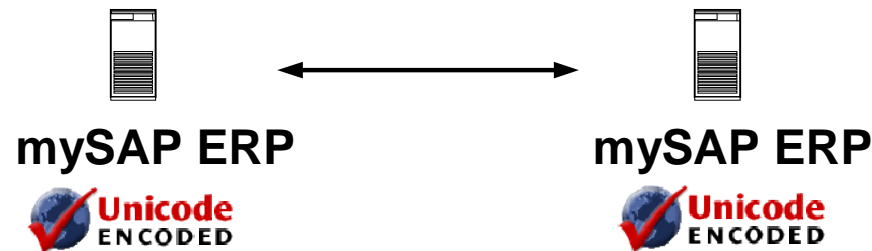
Conversion Example : Unicode to/from Single Code Page

Language	Word (same word)	Codepage			
		UTF-16 Big Endian	UTF-8	ISO	Windows
		2 Byte per Character	1 Byte: asc 2 Byte :nas 3 Byte as	1 Byte nas 2 Byte:as	1 Byte nas 2 Byte: as
German	Alex	0041 006C 0065 0078	41 6C 65 78	41 6C 65 78	41 6C 65 78
Russian	Алекс	0410 043B 0435 043A 0441	D090 D0BB D0B5 D0BA D181	B0 DB D5 DA E1	C0 EB E5 EA F1
Japanese	アレックス	30A2 30EC 30b3 30AF 30B9	E382A2 E383AC E38383 E382AF E382B9	8341 838C 8362 834E 8358	8341 838C 8362 834E 8358
Thai	อเล็กซ์	0E2D 0E40 0E25 0E01 0E0B	E0B8AD E0B980 E0B8A5 E0B881 E0B88B	CD E0 C5 A1 AB	CD E0 C5 A1 AB

Legend: asc = ASCII, as = Asian , nas = non-Asian

Conversion between Unicode and non-Unicode in particular difficult for Asian languages

SAP RFC Unicode ↔ Unicode



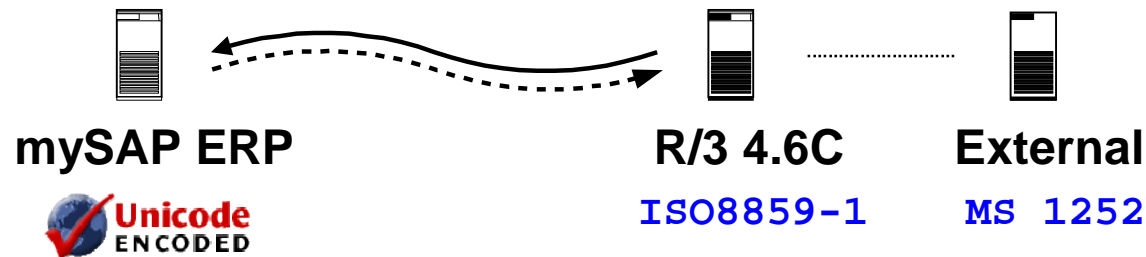
In case of an Unicode ↔ Unicode combination RFC passes all character data without code page conversion or merely with adaptation of the endianness.

- UTF-16 big endian = SAP code page 4102
- UTF-16 little endian = SAP code page 4103

Information about the destination is maintained in SM59 →
→ *special options* → character width in target system

- 1 Byte = non-Unicode
- 2 Byte = Unicode

RFC SAP Unicode ↔ Non-Unicode Single Code Page



In case of an Unicode ↔ non-Unicode single code page combination RFC passes all character data with code page conversion between Unicode and the single code page.

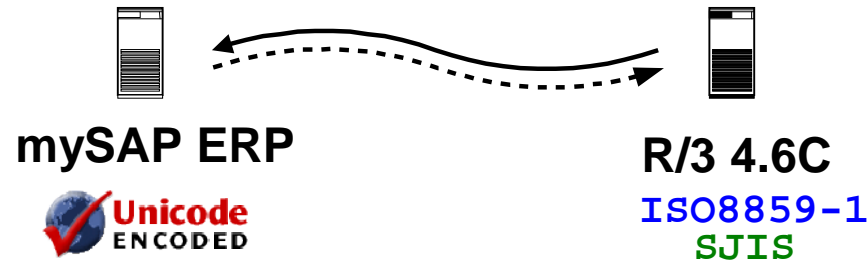
As Unicode is a true superset of any old standard codepage not all Unicode characters can be transferred to the non-Unicode system. If the partner is an external single code page system the same conversion rules between Unicode and single code page apply.

Unicode to Single Codepage only allows valid characters for target codepage

Ä	↔	Ä
ß	↔	ß
あ	→	#
東	→	#
한	→	#
₩	→	#

Invalid characters in ISO-8859-1 / MS 1252 system

RFC SAP Unicode ↔ SAP Non-Unicode MDMP



In case of an Unicode ↔ non-Unicode MDMP combination RFC passes all character data with code page conversion between Unicode and the different old code pages if RFC transfer structure contains a language key.

Which of the MDMP code pages is chosen depends on the language:

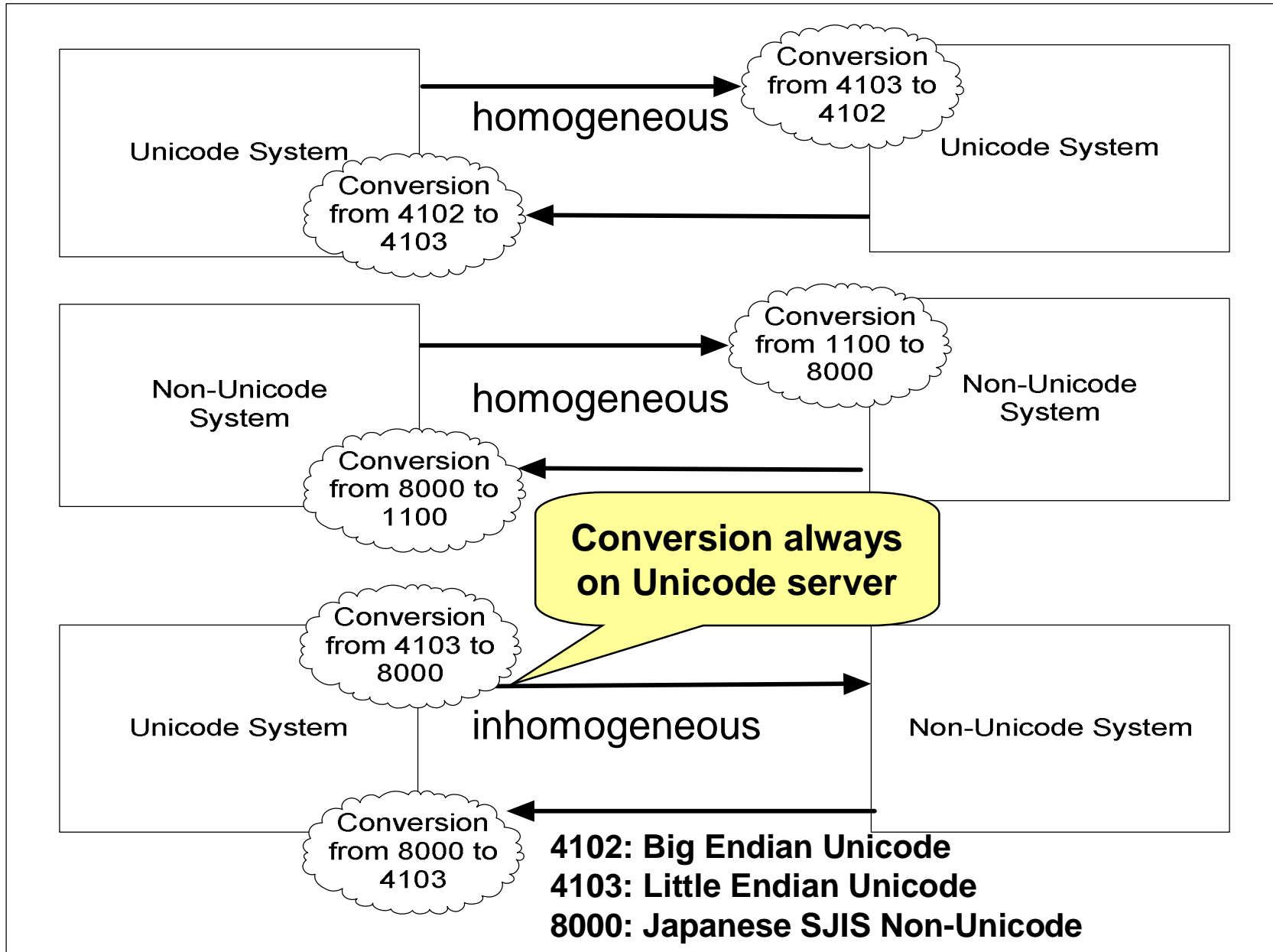
Ä	← DE →	Ä
ß	← DE →	ß
あ	← JA →	あ
東	← JA →	東
한	→	#
₩	→	#

Unicode to MDMP only allows valid characters of configured codepages

Invalid in ISO-8859-1 and SJIS

Mixed codepage payload communication between SAP MDMP and 3rd party system NOT supported !

Codepage Conversion in RFC Communication



SM59: SAP Unicode Calls External Unicode System (6.40)

The screenshot shows the SAP SM59 configuration interface for an RFC Destination named 'SAPSLDAPI'. The 'Unicode Test' tab is active. The 'RFC Destination' is 'SAPSLDAPI' and the 'Connection Type' is 'T' (TCP/IP Connection). Under 'Description', 'Description 1' is 'SAPSLDAPI'. The 'Special Options' tab is selected, showing 'Special Flags' (Trace and Slow RFC Connection are unchecked) and 'RFC Bit Options'. Under 'Character Width in Target System', the 'Unicode' radio button is selected. The 'MDMP Settings' are 'Inactive'. Under 'Character Conversion', the 'Default Setting' is 'Ignore Error, Error Indicator: '#' = U+0023'.

The RFC connection to an external (Type T) Unicode system is marked with character width Unicode . The Unicode test can be used to verify

SM59: Check if Registered Server in Unicode (6.40)

Destination System information Test System Help

RFC Destination SAPSLDAPI

Test connection Unicode Test

RFC Destination SAPSLDAPI
Connection Type T TCP/IP Connection

Description
Description 1 SAPSLDAPI
Description 2
Description 3

Technical Settings Logon/Security Special Options

Activation Type
 Start on Application Server
 Start on Explicit Host
 Start on Front End Work Station
 Registered Server Program

Registered Server Program
Program ID SAPSLDAPI_UNICODE

Gateway Options
Gateway host localhost
Gateway service sapgw00

Information
Target is a unicode system (char.size 2)

The registered external program should be Unicode enabled

SM59: SAP Unicode Calls External Non-Unicode

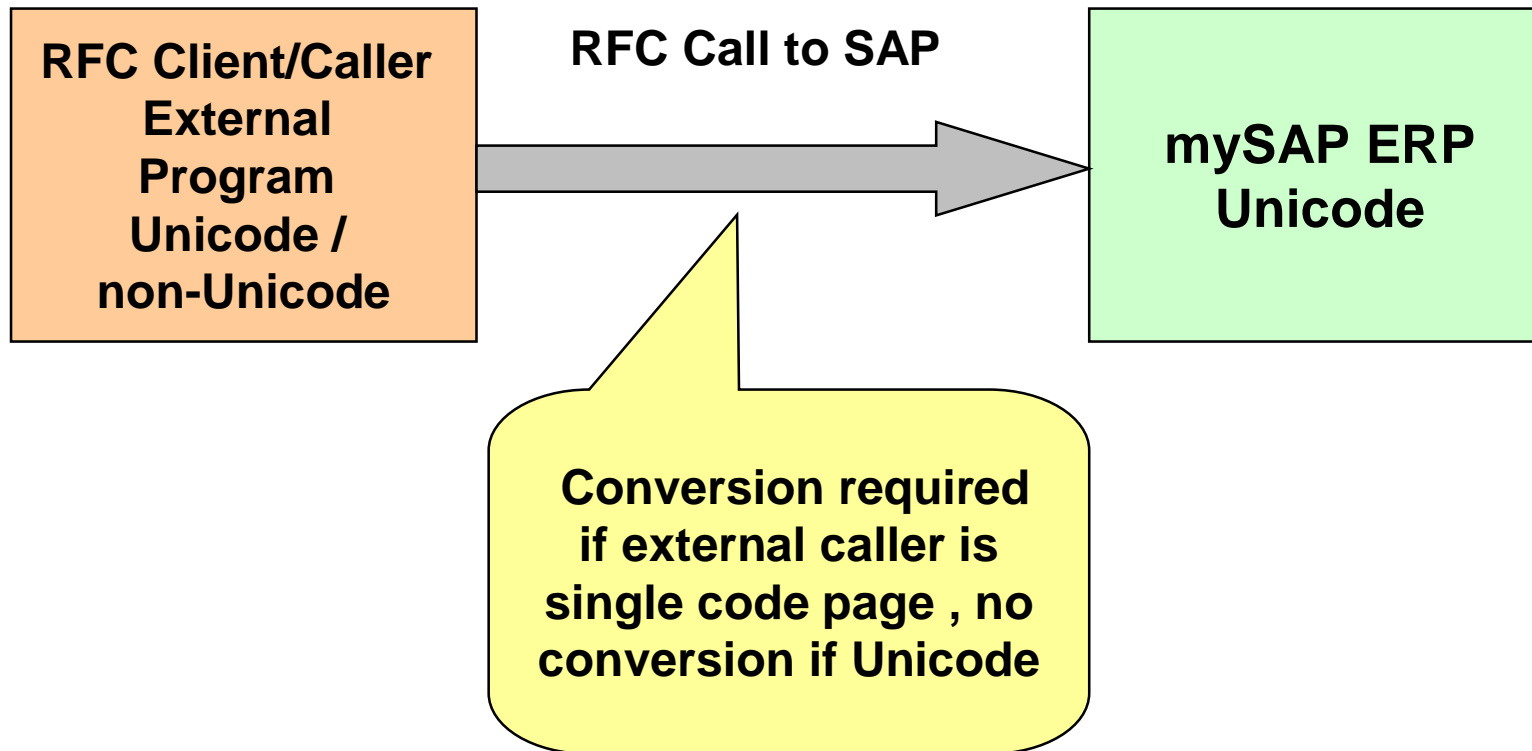
The screenshot displays the SAP SM59 transaction for RFC Destination **AMADEUS_IDES**. The interface is divided into several sections:

- Connection Test / Unicode Test:** Shows RFC Destination **AMADEUS_IDES** and Connection Type **T TCP/IP Connection**.
- Description:** Three empty description fields.
- Administration / Technical Settings:** Shows **Communication Type with Target System** set to **Non-Unicode**. Under **MDMP Settings**, **Inactive** is selected. **Unicode** is also an option.
- Character Conversion:** Shows **Default** as the selected option.
- System: Status:** A pop-up window showing system information:
 - Usage data:** Client **700**, User **DAVIDENKOFF**, Language **EN**, Previous logon **15.08.2006 17:30:48**, Logon **18.08.2006 14:07:27**, System time **14:52:22**.
 - SAP data:** Repository data, Transaction, Program (screen).
 - SAP System data:** Component version **SAP NetWeaver**, Installation number **0120021077**, License expiration **31.12.9999**, Unicode System **Yes**.
 - Database data:** Database system **DB6**, Release **08.02.0003**, Name **QPT**, Host **usdbqpt**, Owner **SAPR3**.

Two yellow callout boxes provide additional context:

- A callout pointing to the **Language EN** field in the System Status window states: **Conversion code page SAP Unicode – external non-Unicode derived from logon Language, here EN: Unicode → LATIN-1**
- A callout pointing to the **Non-Unicode** radio button in the Communication Type section states: **external program is non-Unicode**

External Program Calls SAP Unicode Via RFC Library



Many SAP connectors and other certified interfaces use RFC libraries to connect to SAP systems

External Program is Unicode:

- Homogenous communication, no data loss
- Automatic recognition of Big and Little Endian

External Program is non-Unicode (Single Code Page): RFC determines communication code page and converts between this code page and Unicode

- Default code page
 - Environment parameter **SAP_CODEPAGE**
Example in UNIX: setenv SAP_CODEPAGE 8000
 - RFC API **RfcSetSystemCodepage**
- Explicit code page
 - **RfcOpenEx** at connection time
Example: RfcOpenEx (“... CODEPAGE=8000 ...”,...)
 - **RfcSetCodepage** at runtime
Example: RfcSetCodepage (handle, “8000”);



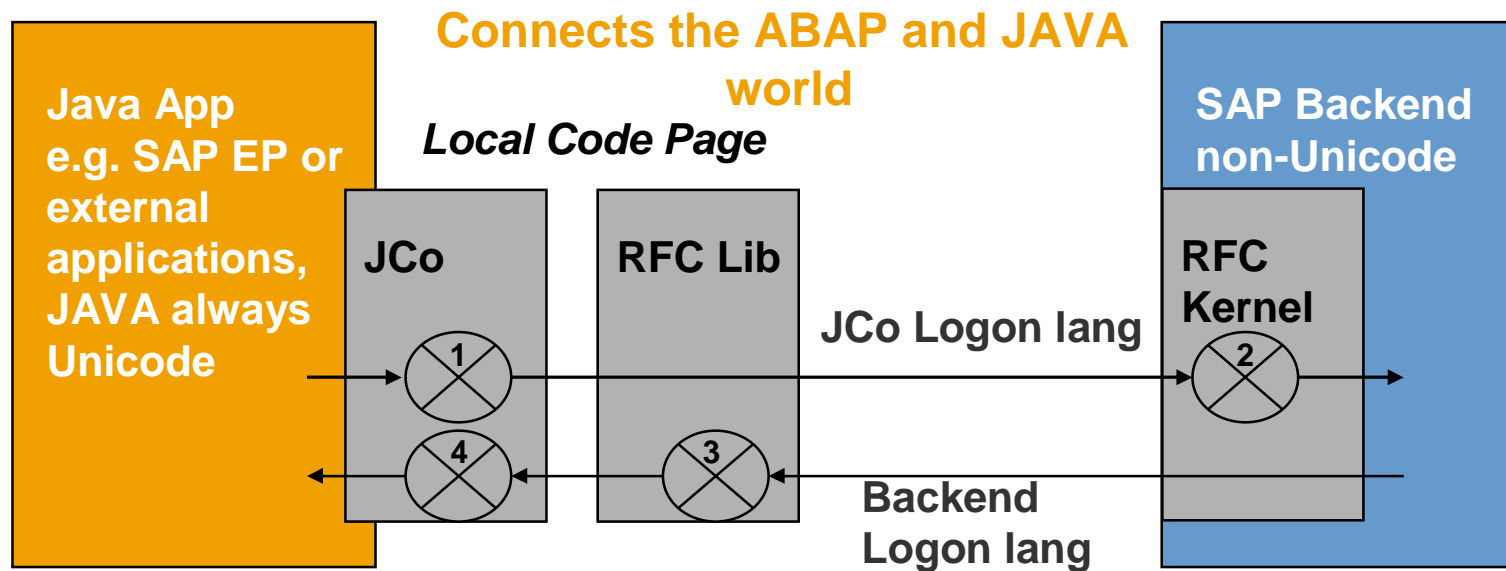
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JAVA Connector And RFC Library (Non-Unicode Backend)



Dataflow from Java application to SAP backend system

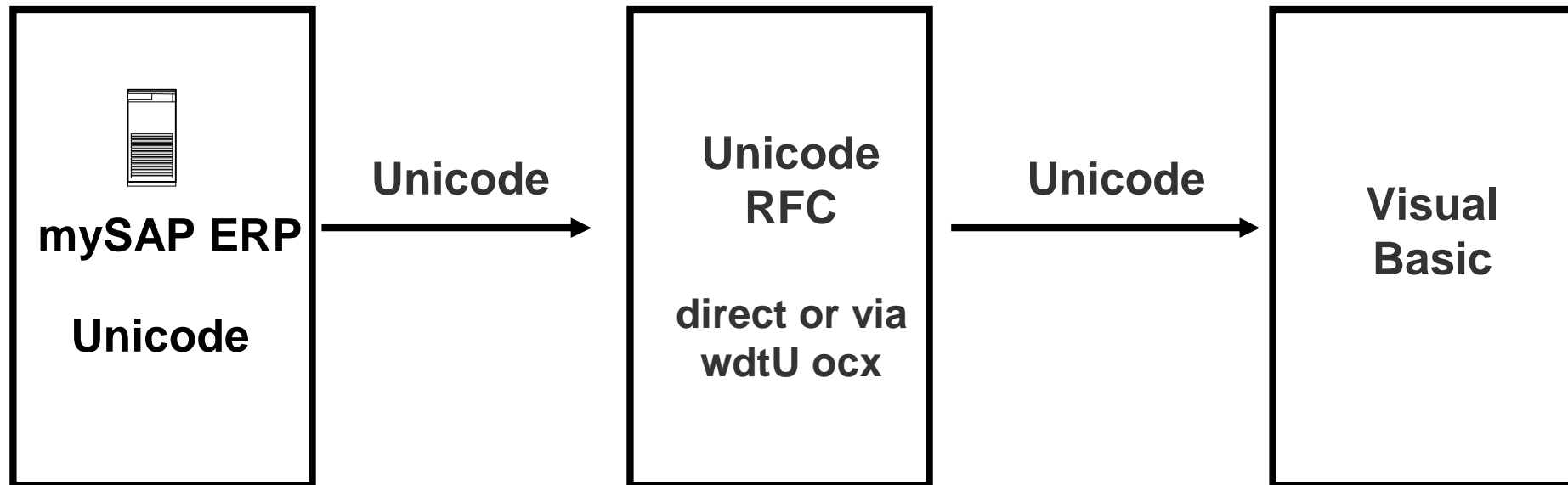
1. Conversion from UTF-16 (JAVA) into local Code Page (CP)
2. Conversion from local CP into one SAP CP, controlled by JCo logon language

Dataflow from SAP backend system to Java application

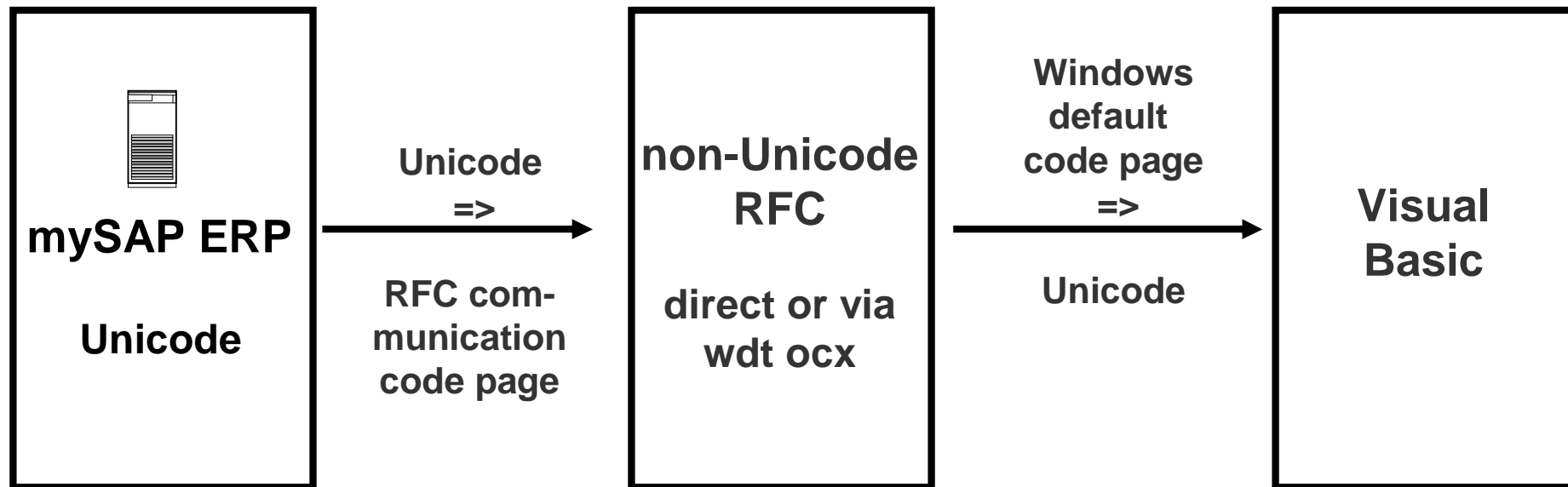
3. Conversion from one SAP CP into local CP, controlled by Backend logon language
4. Conversion from local CP into UTF-16 (JAVA)

Conversion only correct for one code page per connection!

Connects the ABAP and .NET world

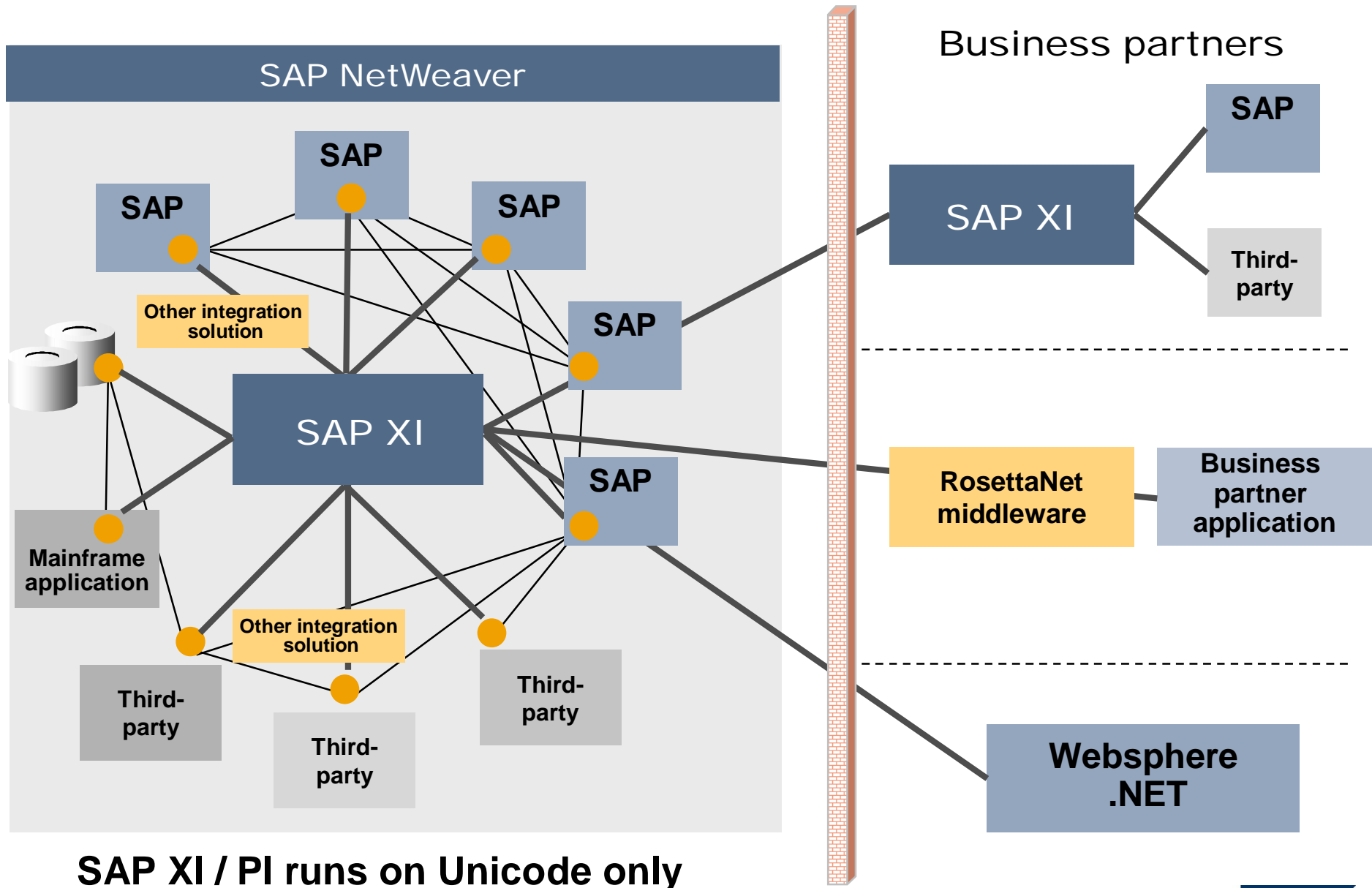


- With Unicode RFC / Unicode wdtU ocx no code page conversion needed
- Standard Visual Basic UI controls do not support Unicode, MS Office controls do
- Visual Basic .NET uses Unicode
- Via .NET Connector communication with Unicode and non-Unicode partners possible



- Data transfer is restricted to Windows default code page, to configure in Windows Control Panel → Regional and Language Options
- RFC partner code page must match to Windows default code page (e.g. LATIN-1 : MS 1252 : SAP Codepage 1160)

Integration of External Systems Through SAP XI / PI



SAP XI / PI runs on Unicode only

The Adapter Engine hosts a set of adapters:

■ SAP Adapters

- File / FTP
- JDBC (Database)
- JMS (MQSeries, SonicMQ, ...)
- RFC
- SOAP
- Mail
- Business Connector (B2B protocol)
- Marketplace Adapter
- RosettaNet (RNIF 2.0) Adapter
- CIDX (RNIF 1.1) Adapter

■ 3rd Party Adapters

- iWay: UCCnet, more to come ... (Peoplesoft-, Siebel-, Oracle, UCCnet-, Transora- and AS2- adapters already certified for SAP XI 3.0) ...
- Seeburger: numerous EDI adapters: AS2, Generic EDI, OFTP, VAN Access, Payment, several Industry Specific Adapters (incl. mappings)
- Optional: Adapters developed by partners, certificated by SAP

... Supporting Unicode And Single Codepage

The screenshot shows the SAP Integration Builder configuration window for an XI File Adapter. The window title is "Configuration: Integration Builder (iwdf5108_TK8_00)". The main configuration area is titled "Edit Communication Channel" and shows the following details:

- Communication Channel: File
- Party: (empty)
- Service: Airline_Group_Two
- Description: File Test Adapter

The "Parameters" tab is selected, showing the following settings:

- Adapter Type: File
- Adapter URL: http://sap.com/xi/XI/System
- SAP BASIS: 6.40
- Sender/Receiver: Receiver (selected)
- Transport Protocol: File System (NFS)
- Message Protocol: File
- Adapter Engine: Integration Server

The "File Access Parameters" section includes:

- Target Directory: c:\data
- File Name Scheme: xi_output.dat

The "Processing Parameters" section includes:

- File Construction Mode: Add Time Stamp
- File Type: Text
- File Encoding: UTF-8
- Operating System Command: (empty)

The "Variable Substitution (Target Directory/File Name Scheme)" section has an "Enable" checkbox which is currently unchecked.

Two yellow callout boxes provide additional information:

- The first callout box, titled "Example: XI File Adapter", points to the "Service" field.
- The second callout box, titled "Permitted values for the file code page are the existing charsets of the Java runtime as e.g. US-ASCII, ISO-8859-1, UTF-8, UTF-16BE, ...", points to the "File Encoding" field.

Code Page Information About XI Adapters

<http://service.sap.com/xi> --> XI in Detail → Connectivity

Technical Adapters

Message format or transport protocol supported by adapter	Name of adapter	Provided by
Database systems	JDBC Adapter	SAP
File systems and FTP servers	File/FTP Adapter	SAP
HTTP protocol	Plain HTTP Adapter	SAP
Messaging systems	JMS (Java Messaging Service) Adapter	SAP
SOAP	SOAP Adapter	SAP
E-mail server	Mail Adapter	SAP
SAP Business Connector	SAP Business Connector Adapter	SAP
mySAP marketplaces	Marketplace Adapter	SAP
Cross Industry (Payment)	Cross Industry Payment Adapter	SEEBURGER
VAN	VAN Access Adapter	SEEBURGER

Supported data transfer languages

(codepages of connected systems, Unicode, etc.)

Text files should be based on codepage UTF-8 in order to be processed by the Integration Engine.

Nevertheless, the file/FTP Adapter can

- Use any codepage installed in the Java runtime environment (in the case of foreign character sets) to convert the files from any codepage sent by the Integration Server to any codepage
- Convert files from any codepage to UTF-8 when sending to the Integration Server



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Communication Examples

Example: Connecting WebMethods to SAP Unicode System

The webMethods for SAP solution extends the benefits of the SAP Netweaver architecture and avoids time-consuming and costly recoding by delivering powerful new functionality, including (see www.webmethods.com for information)

- An out of the box graphic mapping tool
- Strong support for XSLT, FLOW and Java mappings
- Integration to heterogeneous operating environments
- Improved multi-enterprise, multi-application functionality
- Best-of-breed trading partner management
- Automated message delivery and system of record management
- Communication with Unicode Systems

How to configure the SAP Unicode – webMethods connection ?

Connecting WebMethods to a SAP Unicode System

STEP1:

- **Check and verify that SAP webMethods Adapter supports Unicode.**

STEP2:

- **Use webMethods latest SAP Adapter to connect to the Unicode SAP System. The newest version of SAP webMethods supports an Unicode SAP System. Use latest Jco archives to connect with the SAP system**

STEP3:

- **In SAP System configure RFC Destination with Character Width / Communication Type in Target System as Unicode**

STEP4:

- **RFC Listener should be configured with Unicode in webMethods SAP Adapter improved multi-enterprise, multi-application functionality**

RFC Settings in SAP For WebMethods Destination

The screenshot shows the SAP configuration interface for an RFC Destination named 'CDU_WM'. The 'Connection Type' is set to 'TCP/IP Connection'. Under the 'Description' section, 'Description 1' is 'webMethods'. The 'Administration' tab is active, showing the 'Communication Type with Target System' section where the 'Unicode' radio button is selected. A yellow callout bubble points to this selection with the text: 'Configure RFC Destination with Communication Type Unicode'. Below this, the 'Character Conversion' section has 'Default Setting' selected, with the note 'Ignore Error, Error Indicator: '#' = U+0023'.

Connection Edit Goto Extras Utilities(M) System Help

RFC Destination CDU_WM

Connection Test Unicode Test

RFC Destination CDU_WM

Connection Type T TCP/IP Connection Description

Description

Description 1 webMethods

Description 2

Description 3

Administration Technical Settings Logon & Security MDMP & Unicode Sp...

Communication Type with Target System

Non-Unicode

MDMP Settings

Inactive Active

Unicode

Character Conversion

Default Setting Ignore Error, Error Indicator: '#' = U+0023

Short Dump After Conversion Error

Ignore Conversion Errors

Configure RFC Destination with Communication Type Unicode

WebMethods Settings For SAP RFC Unicode Listener

The screenshot shows a web browser window displaying the SAP webMethods Integration Server configuration page. The browser title is "SAP - cccept51.ccg.cementthai.com - webMethods Integration Server - Microsoft Internet Explorer". The address bar shows the URL: `http://cccept51:5050/WmRoot/adapter-index.dsp?url=%2F5AP%2FsapServers_listServers.dsp&adapter=5AP&text=5AP&help=true`. The page content includes a navigation menu on the left with "SAP Servers" selected, and a main configuration area titled "SAP Listener Definition".

SAP Listener Definition

Program ID	CDVCCCEPT85	Number of Threads	5
Gateway Host	CCCEPT81	Gateway Service	sapgw00
Autostart	<input checked="" type="radio"/> Yes <input type="radio"/> No	RFC Trace	<input checked="" type="radio"/> On <input type="radio"/> Off
Repository Server	CDV	Unicode Listener	<input checked="" type="radio"/> Yes <input type="radio"/> No

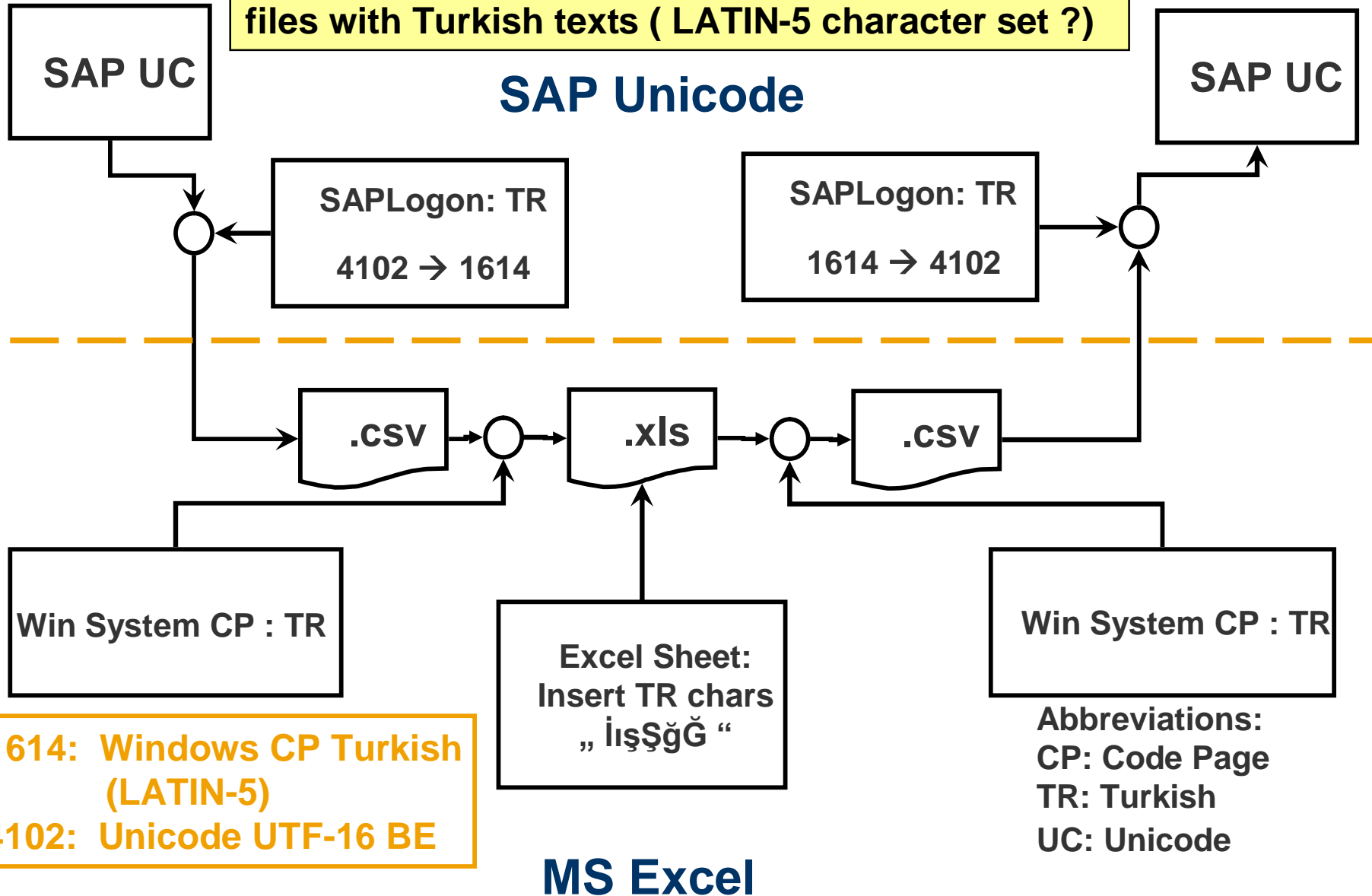
Buttons: Save, Cancel

A yellow callout bubble points to the "Unicode Listener" field, containing the text: **Configure webMethods SAP RFC Listener with Unicode Option**

Example: Excel – Upload / Download of Turkish (TR) Files

How to manage in SAP to upload/download Excel files with Turkish texts (LATIN-5 character set ?)

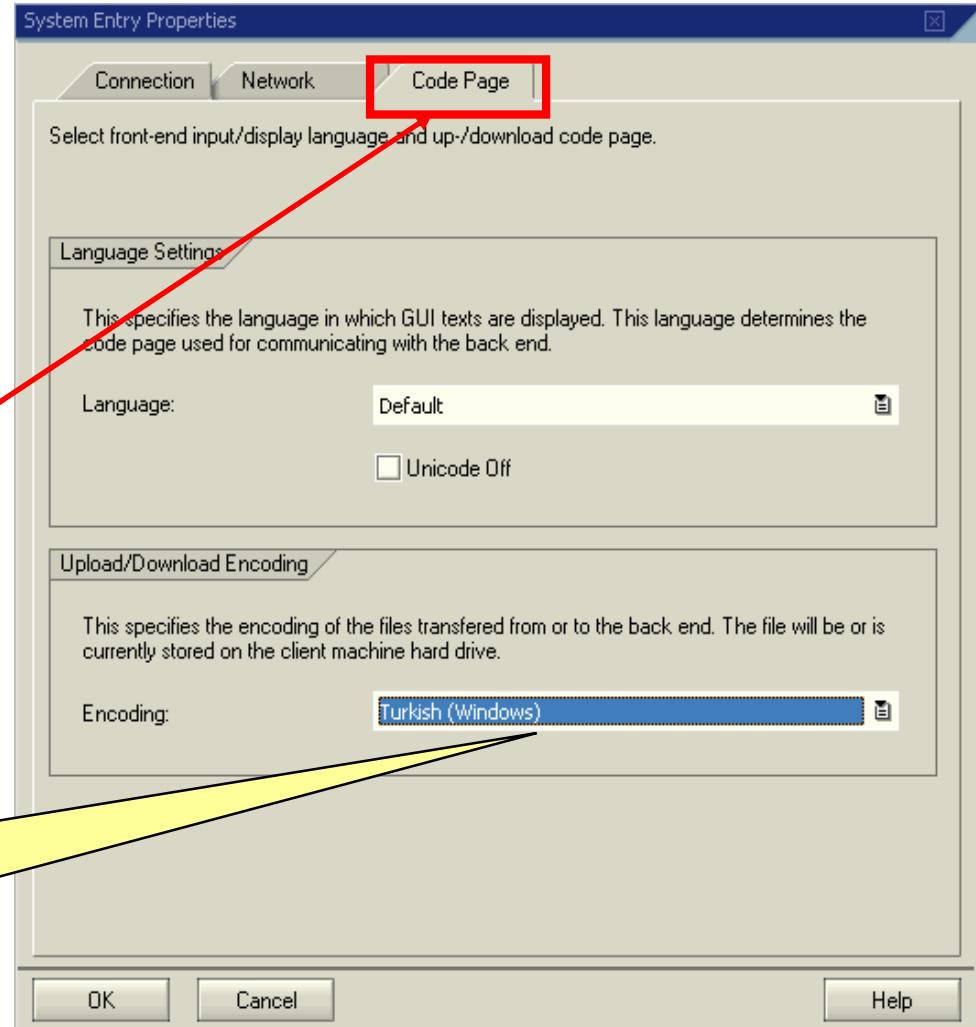
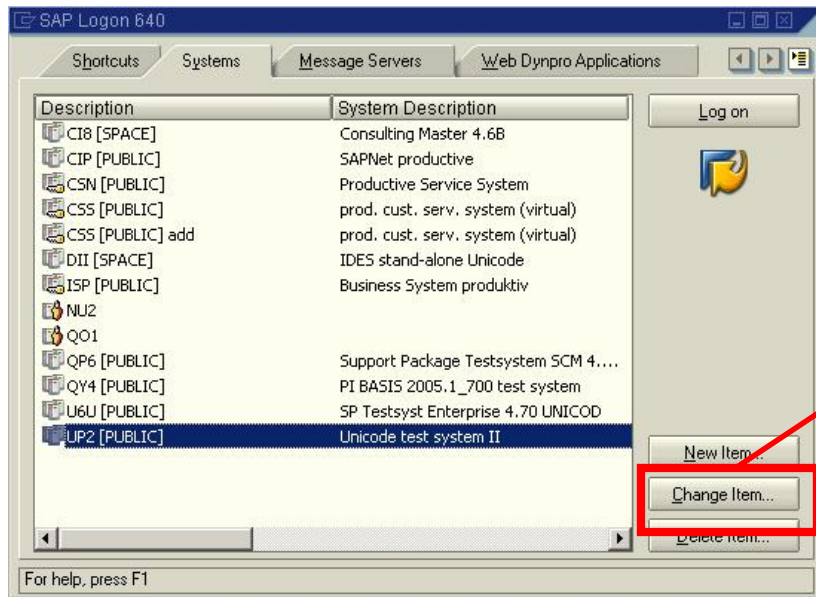
SAP Unicode



SAPLogon Settings per system entry (Upload/Download Encoding)

- **Can be changed by users and per SAPLogon entry**
- **Independent of the Windows System Code Page**
- **Windows System Code Page („Language for Non-Unicode Programs“)**
- **Excel Code Page Handling**
 - **Creation of new Excel sheets**
 - Excel allows to use Unicode and Non-Unicode via “Font Switching” only (change font to e.g. Arial Unicode MS). This is done automatically if you insert special characters from different former code pages.
 - **XLS → CSV conversion**
 - The “SAVE AS .CSV” function supports only the creation of **Non-Unicode** files. The code page of the CSV file is determined by the Windows System Code Page described above
 - **XLS → TXT**
 - The SAVE AS function allows the creation of Unicode files. The encoding format is UTF-16 Little Endian.

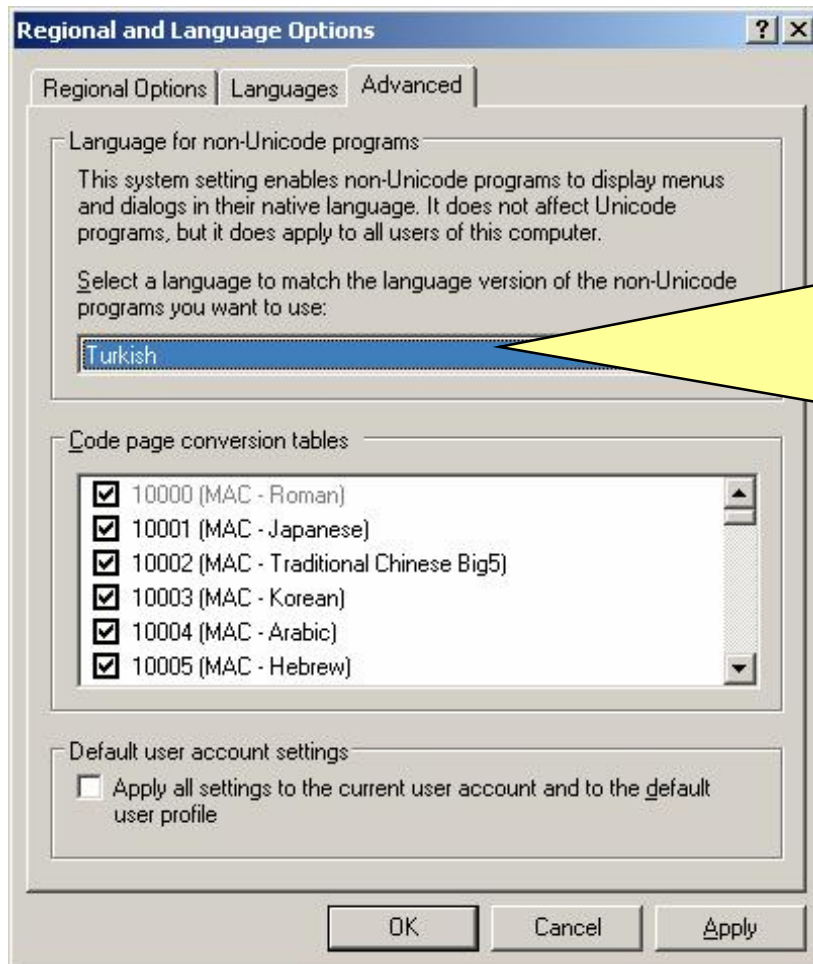
SAPLogon 6.40 Settings



**Encoding set used for
Client - Backend
Communication
(e.g. Excel upload)**

Windows XP System Code Page

- **Start → Control Panel → Regional and Language Options → tabstrip “Advanced” → select the language you wish to work with**



“Language for non-Unicode programs”

- Also called “Default or system code page”
- Some SAPGui components in Unicode still refer to this non-Unicode locale

- **Ideal integration and communication for Unicode based SAP and external systems only**
- **Have a complete list of all critical interfaces in the system landscape with information about communication technology and information if language relevant and which languages exchanged**
- **Check early with vendor of external system if Unicode enabled**
- **In case of inhomogeneous SAP Unicode to single codepage external system connection be aware of code page conversion**
- **SAP systems with ABAP and JAVA stack work ideally together in Unicode only**
- **Consider the deployment of SAP XI / PI to connect to external system**

Further Information



Public Web:

- <http://www.service.sap.com/unicode> : Customer contact
- <http://www.service.sap.com/unicode@sap> : Technology
- www.sdn.sap.com/sdn/developersguide.sdn : NetWeaver Developer's Guide



Related SAP Education Training Opportunities

<http://www.service.sap.com/globalization> → Service Offerings → Unicode



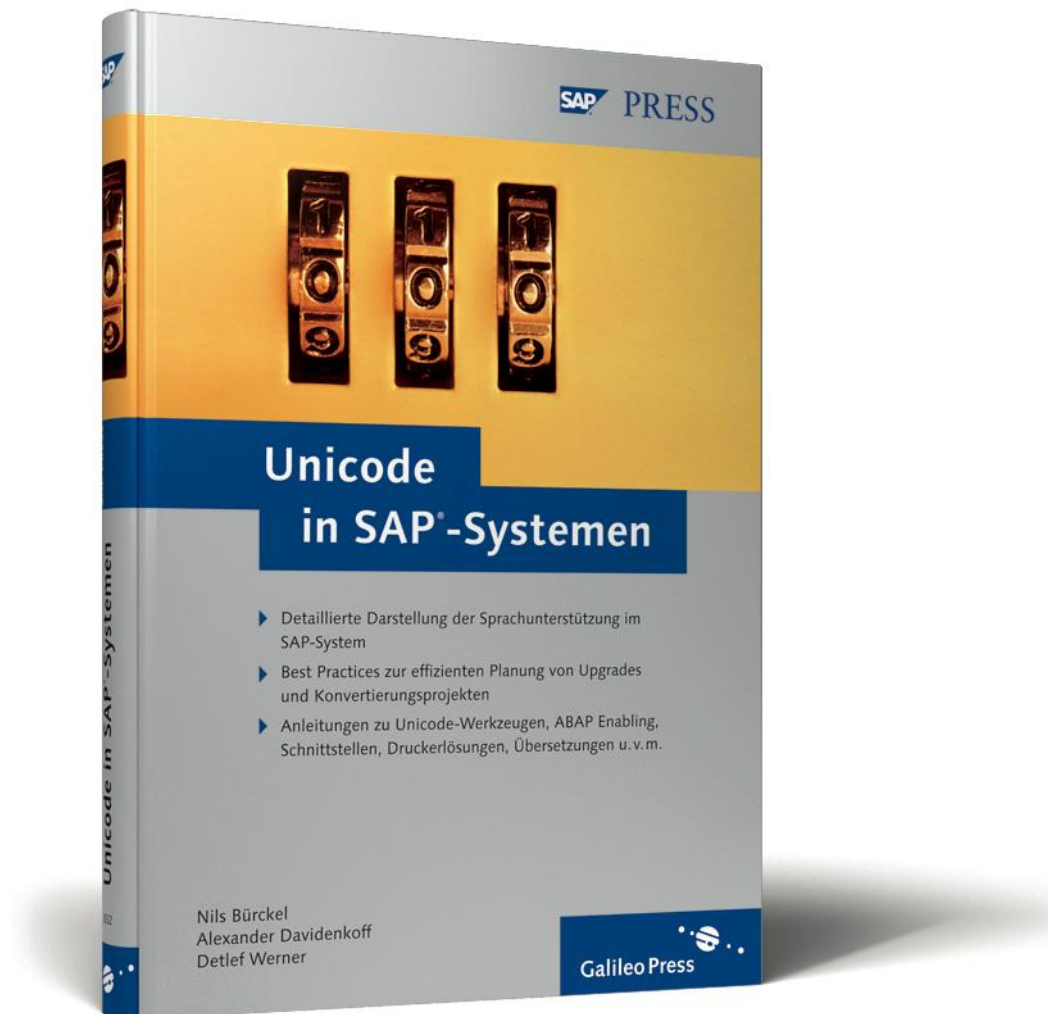
Related Workshops/Lectures at SAP TechEd 2005/2006

- SPC200 Conversion of SAP Systems to Unicode, lecture
- SPC251 Making Programs Unicode Enabled
- EPI108 Unicode Everywhere Now: How Can You Deal with Different Encodings" in Your IT Ecosystem? ASUG
- SPC205 ASUG Influence Update: Computing Infrastructure

New Book "Unicode in SAP-Systemen"

**Available
end October 2006
in German first,
English follows**

**SAP PRESS
340 pages
ISBN 3-89842-832-X**



<http://www.sap-press.de/katalog/buecher/titel/gp/titelID-1321>

Questions?

Q&A



THANK YOU FOR YOUR
ATTENTION !

QUESTIONS – SUGGESTIONS – DISCUSSION



Please complete your session evaluation.

**Be courteous — deposit your trash,
and do not take the handouts for the following session.**

Thank You !

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