

IBM CICS SOA Roadmap and V4.1 Highlights

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Agenda

- Web Services in CICS TS V3
- CICS SOA Roadmap
- CICS TS V4.1 Highlights
- Questions

Web Services at a glance in Version 3

CICS TS V3.1

The runtime support in CTS 3.1 is for

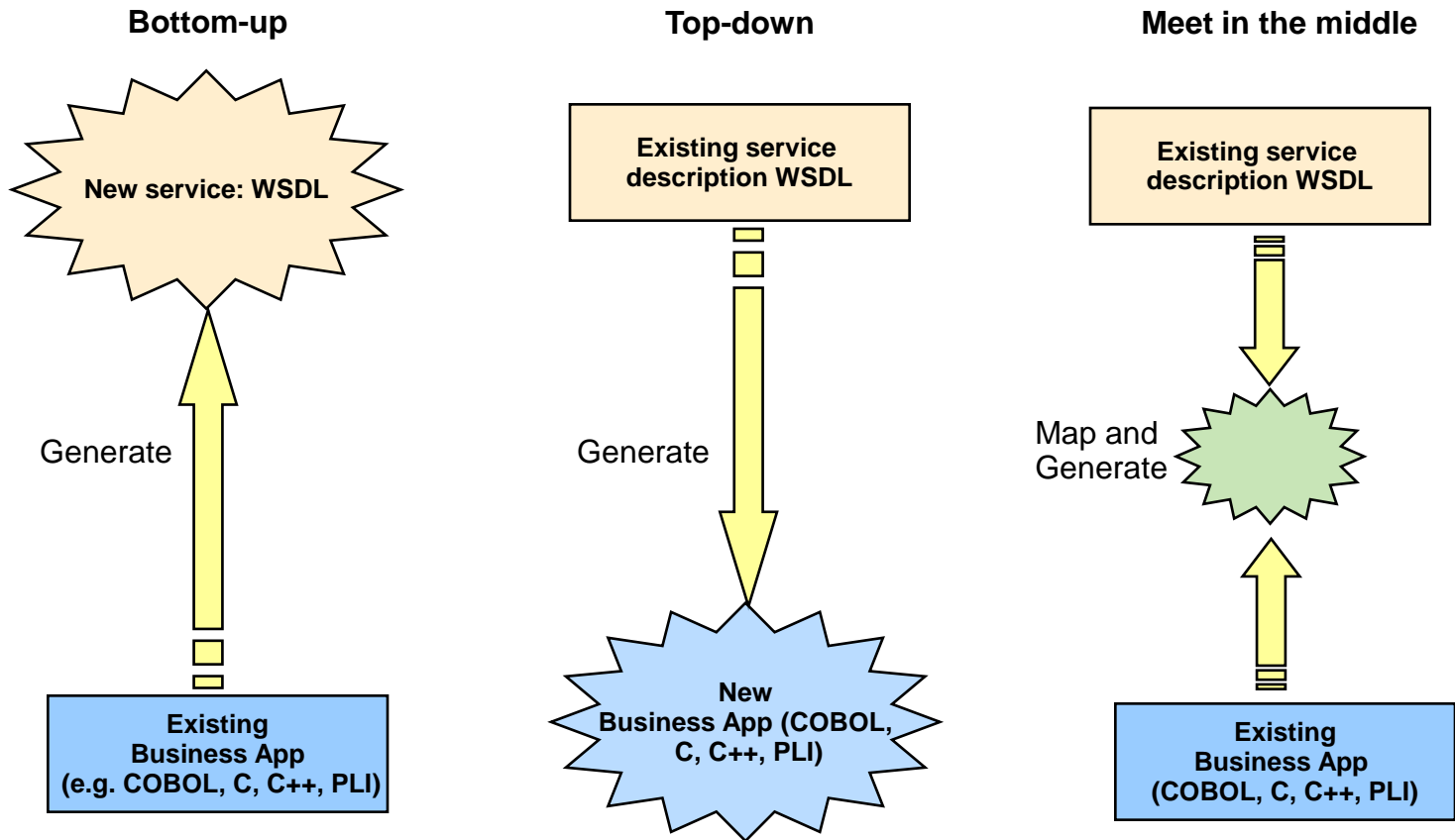
- WSDL 1.1
- SOAP 1.1 and SOAP 1.2
- WS-I Basic Profile 1.1
- XML 1.0
- WS-I Simple SOAP Binding Profile 1.0
- WS-AT 1.0
- WS-Security 1.0
- Provides batch tooling to handle generation of data mappings
 - Schema into (and vice-versa)
 - C
 - PI/I
 - Cobol

CICS TS V3.2

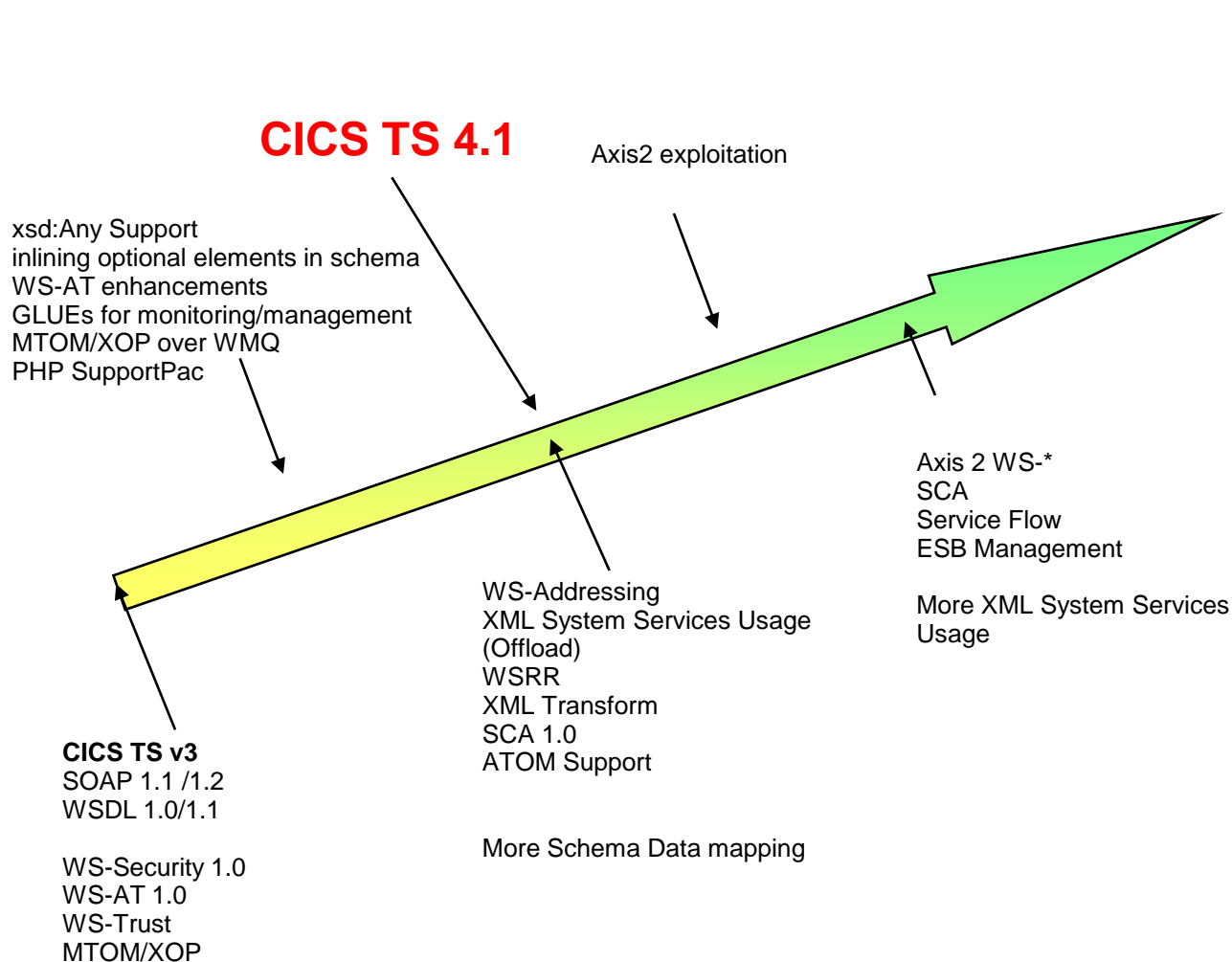
Support was added for

- WSDL 2.0
- MTOM/XOP
- WS-Trust
- Additional schema data mappings

Web Services Enablement Styles



CICS SOA Roadmap



Web Services Vision

CICS TS continues as a First-Class Web Services endpoint (Provider and Consumer).

The environment of choice for Web Services that interact with CICS assets.

CICS TS V4.1 SOA Highlights

- Web Services Highlights
- Resource Deployment / Life cycle – BUNDLE
- WEB 2.0 ATOM Support
- CICS PIPELINE Internal Transport
- SCA Support

Web Services Enhancements

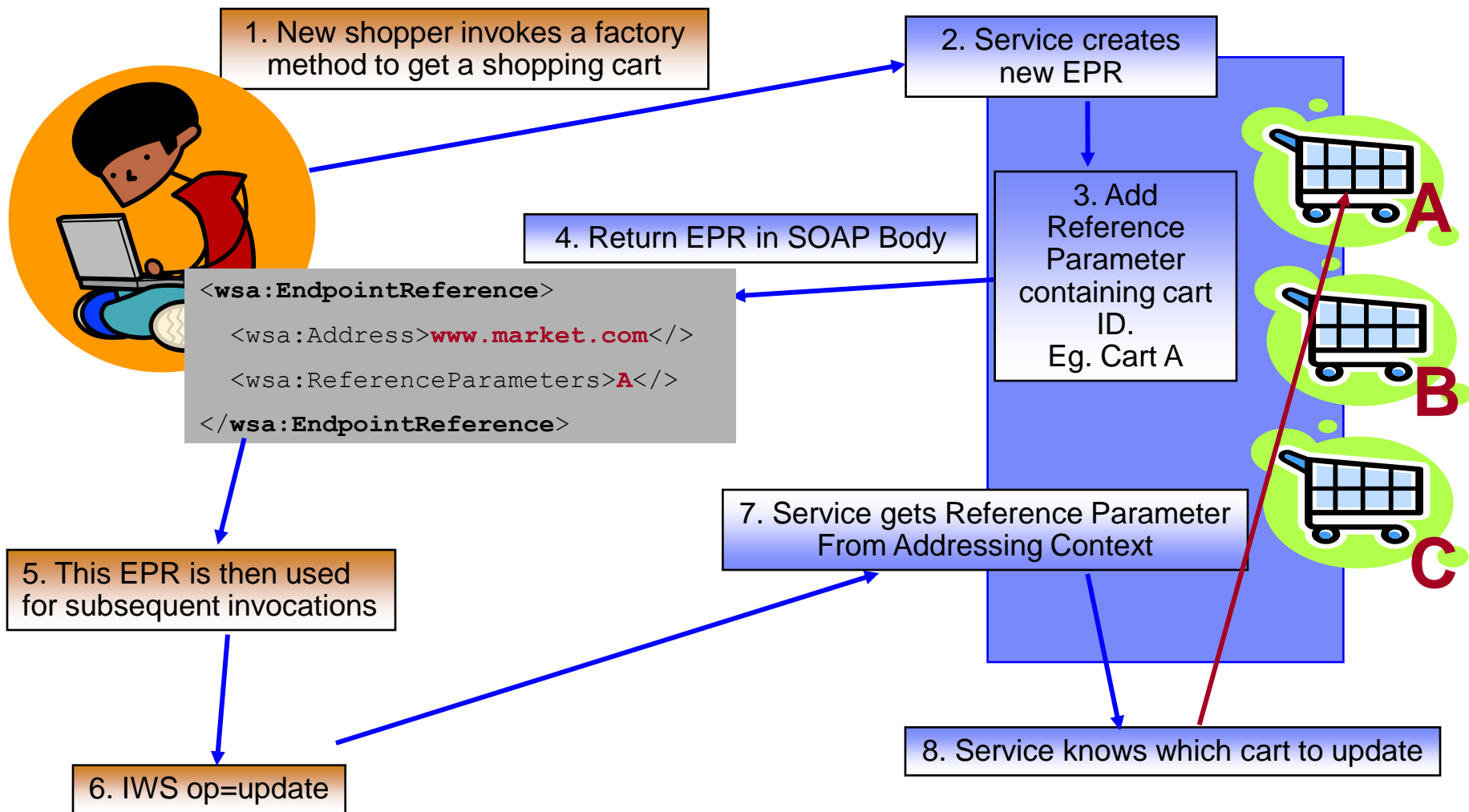
- Delivering WS-Addressing support
 - Improve SOA interoperability by adopting the most current standards
- Reducing TCO of web services solutions by offloading XML content processing
 - SOAP parsing to exploit XML System Services parser
 - XML Systems Services parser provides
 - n Significant SOAP Message parsing improvements, resulting in overall Web Services improvement
- Web services Global User Exit points
- Integrating WSRR support with CICS Web Services assistants
- Providing generalized XML to language structure system mapping component and data mapping enhancements

WS-Addressing

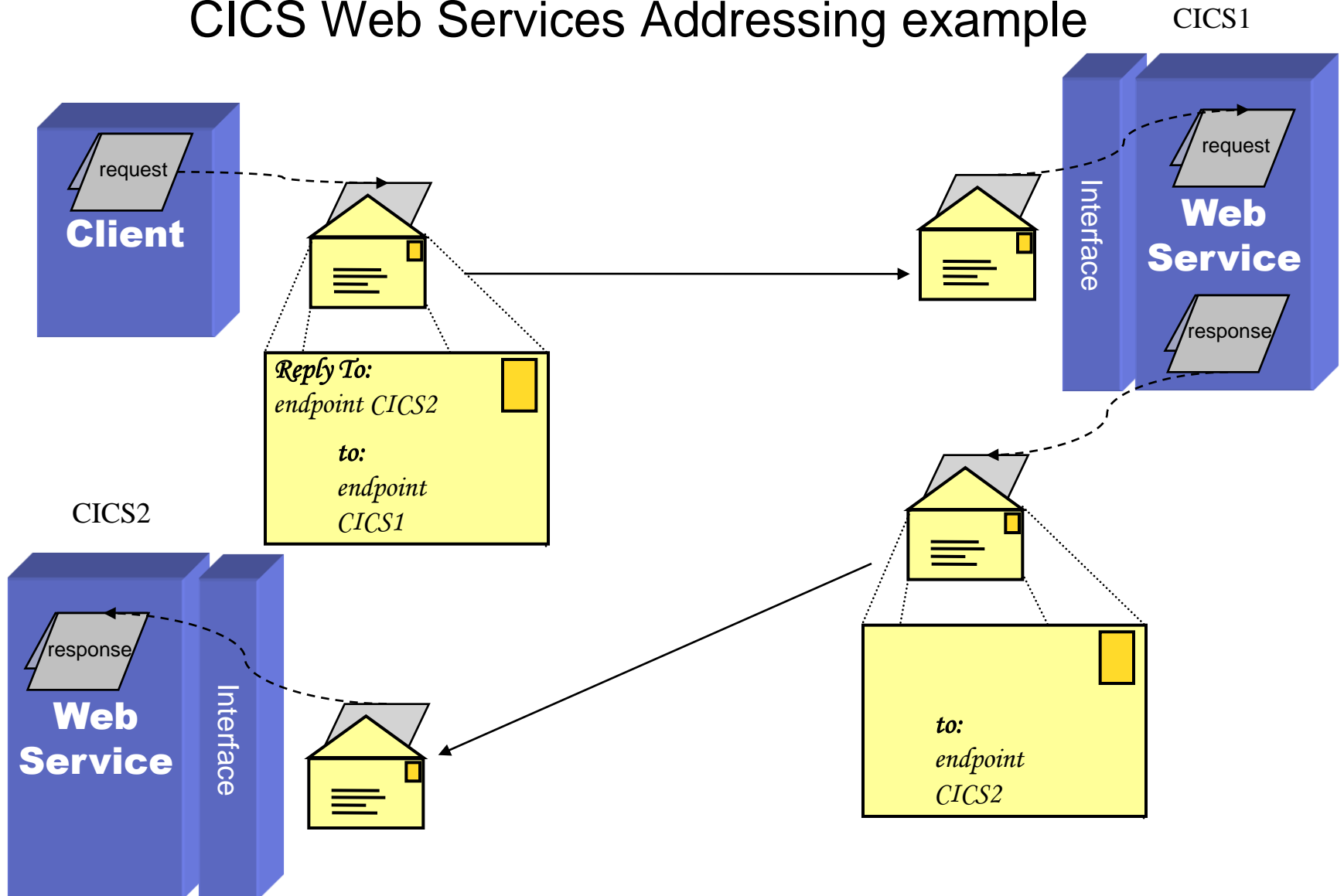
WS-Addressing goals

- Defines transport-neutral mechanisms to address Web services and support message transmission through networks
 - Improves interop with other Web Services implementations such as .NET
 - XML elements to identify Endpoints:
EndpointReferences (EPRs)
 - More than just a URI
 - Can have Reference Parameters and metadata
 - Allows for Psuedo-Conversational style web service requesters in CICS
 - WS-Addressing Message Addressing Properties (MAPs)
 - Standard placeholders in the SOAP header for WS-Addressing information
 - Plus reference parameters in target EPR

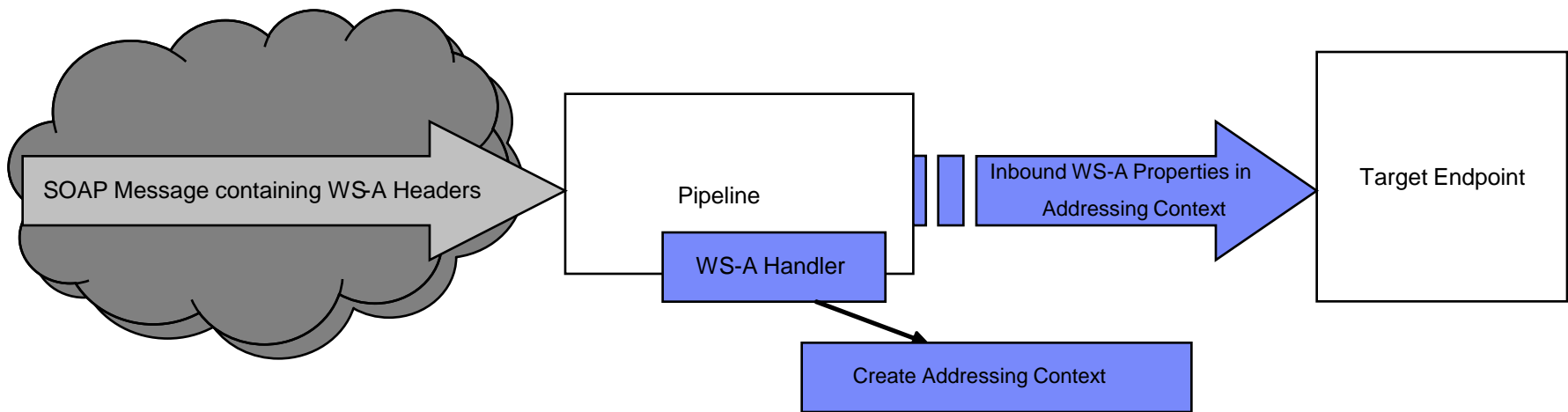
Example of a WS-Addressing Resource Access Pattern



CICS Web Services Addressing example



WS-Addressing in CICS



WS-Addressing in CICS

- Pipeline configuration
 - Configure Requester pipeline to use WS-Addressing handler giving specification version
 - Configure Provider pipeline to use WS-Addressing handler
- Requester
 - Requester application not aware requests are WS-Addressed
 - CICS handles the required addressing responses
 - Requester WS-A aware
 - Uses EXEC CICS API to set Message Addressing Properties (MAPs)
- Provider
 - Provider application not aware request/response is WS-Addressed
 - CICS handles the required addressing responses and routing
 - Provider WS-A aware
 - uses EXEC CICS API to interrogate Addressing Context (e.g. Fetch To EndPointReference (EPR) to extract Reference parameters)

Web services Mapping
and general data mapping services

Web services Mapping Enhancements – 1 of 2

- Support for new mappings of WSDL constructs to language structures
 - New mapping and runtime levels: 2.1 and 2.2
 - Extends CICS-supplied tooling to handle some relatively common WSDL structures that were not previously supported
- Mapping level 2.1
 - Support for
 - xsd:any, xsd:anyType
 - Inlining of optional elements
 - New DFHWS2LS parameter: `INLINE_MAXOCCURS_LIMIT`
 - Pass through the XML message unchanged (XML-ONLY option on DFHWS2LS) whilst retaining other benefits of CICS Web services support
 - Use of runtime validation
 - Use of EXEC CICS INVOKE WEBSERVICE
 - Available for CICS TS V3.2 via PTF

Web services Mapping Enhancements – 2 of 2

- Mapping Level 2.2
 - As 2.1 plus support for
 - ‘Fixed’ values for xsd:elements
 - Treat the ‘fixed’ element as if it had supplied a default value
 - Fixed values for attributes already supported
 - Enhanced support for xsd:choice
 - via improved mapping
 - Substitution groups
 - Based on the xsd:choice mapping
 - Abstract xsd:elements
 - Improved support by treating as the head of a substitution group
 - Abstract data types
 - Will be supported rather than merely ‘tolerated’
 - Much of this support also to be rolled back to CICS TS V3.2 via APAR

XML to language structure mapping services

- New API to convert between XML and application data
 - Map between XML and language structure
- TRANSFORM
 TRANSFORMTYPE(XMLTODATA ;
 DATATOXML)
- Command options depend on the direction of the transformation
 - XMLTODATA will require XMLTRANSFORM resource, providing metadata used for the transformation
 - XMLTRANSFORM resource installed via Bundle support

WebSphere Service Registry and Repository

CICS support for WSRR

- A Web service registry is the 3rd aspect of Web services
 - Requester, provider, registry
 - WSRR provides central repository for Web services and...
 - Query/search, user defined meta-data, lifecycle, version #, relationships, dynamic service selection and binding, governance, enforce policies, federation with other repositories (e.g. UDDI)
 - Institute best practices, encourages discovery and reuse of Web services

- CICS and WSRR
 - Publish WSDL representing CICS Web service providers
 - Retrieve WSDL representing Web services to be used by CICS requesters
 - Complements CICS Web services assistants, WSDL editors, etc.
 - Currently available as SupportPac CA1N for CICS TS V3

CICS support for WSRR in CICS TS 4.1

- Enhance function, documentation, and provide formal support by delivering WSRR support into base CICS
 - Use-case focus: Using CICS and WSRR
- Support new releases of WSRR
- Integrate SupportPac batch capabilities into the CICS Web services assistant
 - DFHLS2WS extension
 - Generate a WSDL file and WSBind file from copybooks and publish WSDL file to WSRR
 - DFHWS2LS extension
 - Extract a WSDL file from WSRR and generate copybooks and wsbind file

Bundle Resources

Why Bundles?

- Similar in concept to OSGI bundles for Java / Eclipse
- Provide a deployment and life cycle grouping for related application artefacts
 - Provides a single point of management and control
 - The artefacts can be from a number of resource spaces
- Allow such a grouping to express and police its dependencies on other
 - Can express functional or resource related dependencies
- Provide an extension point for Vendor or User artefacts to be deployed and managed alongside CICS Resources

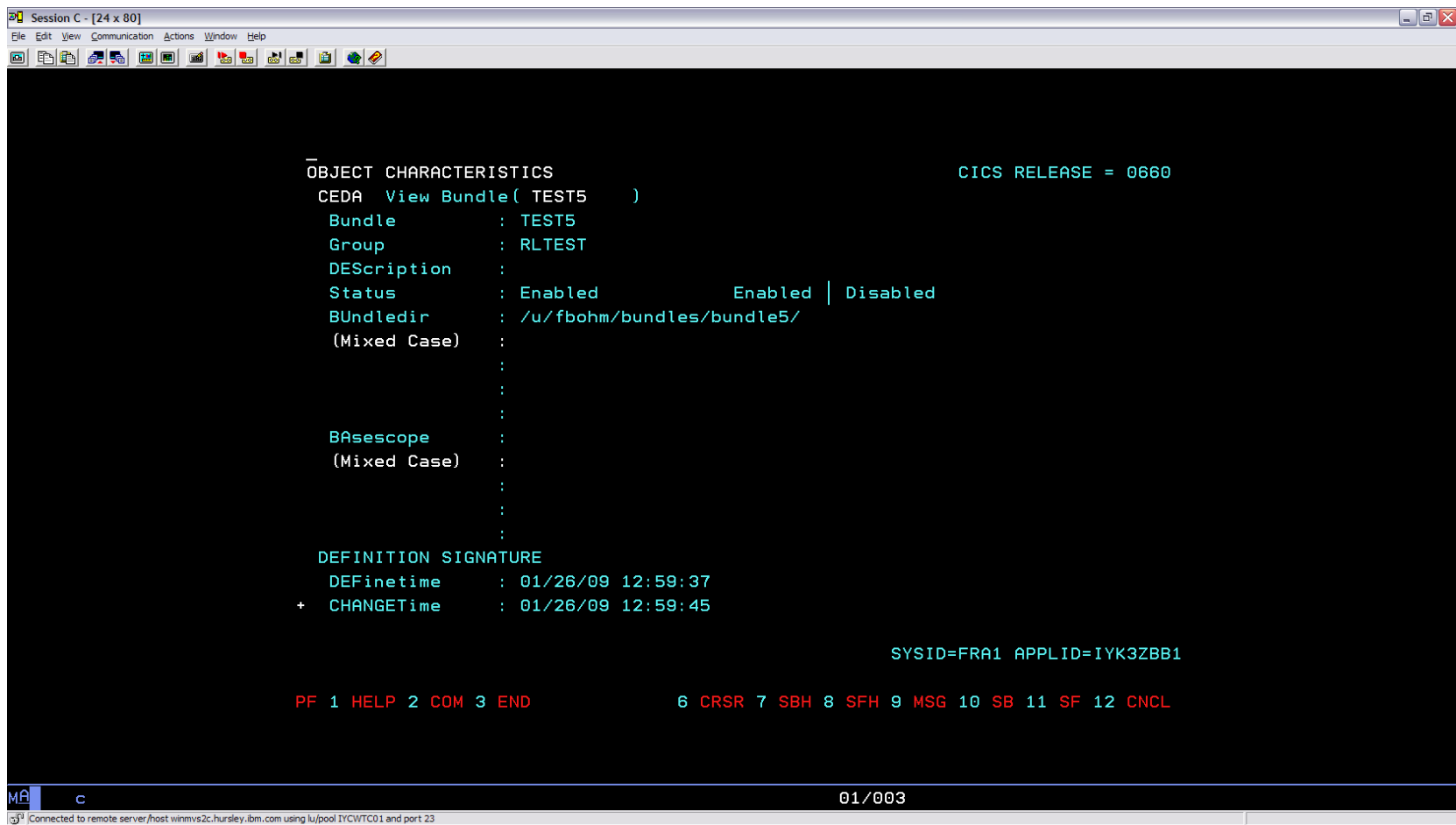
Extensible Resource Framework - BUNDLES

- BUNDLE Resource
- Manifest File describes contents
 - Imports, exports , defines
- Defines
 - Event Binding
 - XSD Bindfile
 - SCA Composite which can create
 - URIMAP
 - WEB SERVICE
 - User extensible via Callback program

Defining Bundle Dependencies

- Imports
 - Things the application uses
 - Defined in other Bundles
 - Defined in the System
 - System imports
 - Program
 - File
 - Pipeline
 - Web Service
 - Transaction
 - TSQModel
 - ...

BUNDLE Resource



The screenshot shows a terminal window titled "Session C - [24 x 80]" with a menu bar (File, Edit, View, Communication, Actions, Window, Help) and a toolbar. The main display area shows the following text:

```
OBJECT CHARACTERISTICS                                CICS RELEASE = 0660
CEDA View Bundle( TEST5  )
  Bundle      : TEST5
  Group       : RLTEST
  Description  :
  Status      : Enabled           Enabled | Disabled
  BUndleDir   : /u/fbohm/bundles/bundle5/
  (Mixed Case) :
  :
  :
  BAsescope   :
  (Mixed Case) :
  :
  :
  DEFINITION SIGNATURE
  DEFinetime  : 01/26/09 12:59:37
+  CHANGETime : 01/26/09 12:59:45

                                           SYSID=FRA1 APPLID=IYK3ZBB1

PF 1 HELP 2 COM 3 END                6 CRSR 7 SBH 8 SFH 9 MSG 10 SB 11 SF 12 CNCL
```

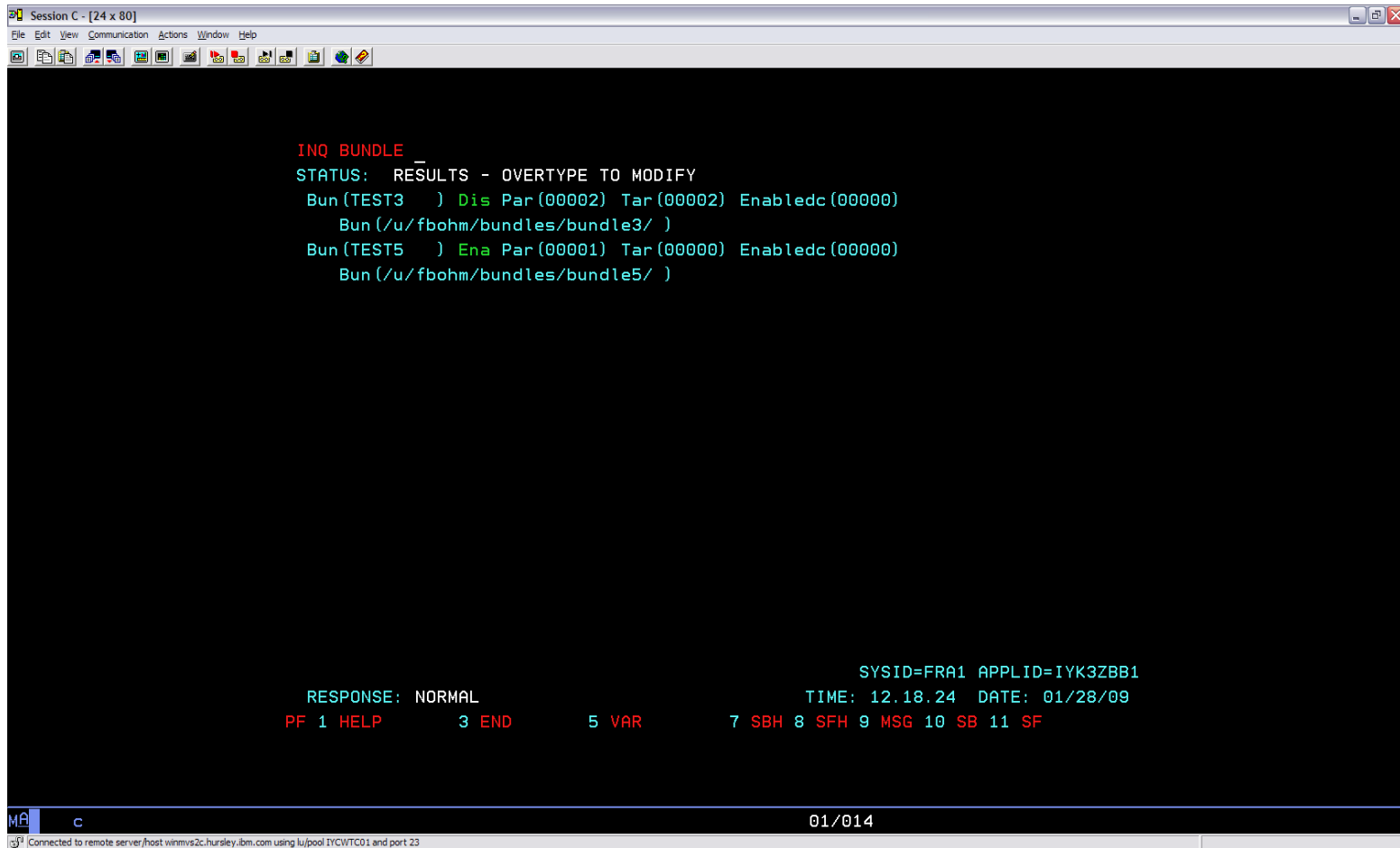
At the bottom of the terminal window, there is a status bar with "MA" on the left, "c" in the middle, and "01/003" on the right. Below the terminal window, a small status bar indicates: "Connected to remote server/host winmvs2c.hursley.ibm.com using lu/pool IYCWTC01 and port 23".

Bundle Contents

.../bundle5
/META-INF
 cics.xml
/scaproject
 testcomposite.scdl

```
cics.xml - Notepad
File Edit Format View Help
<?xml version="1.0"?>
<tns:manifest xmlns:tns="http://www.ibm.com/xmlns/prod/cics/bundle"
  bundleversion="1" bundleRelease="0">
  <tns:define      name="MyComposite"
                  type="http://www.ibm.com/xmlns/prod/cics/bundle/SCACOMPOSITE"
                  path="scaproject/testcomposite.scdl" />
  <tns:import     name="PAYROLL"
                  type="http://www.ibm.com/xmlns/prod/cics/bundle/PROGRAM" />
  <tns:import     name="TaxQuery" |
                  type="http://www.ibm.com/xmlns/prod/cics/bundle/WEBSERVICE" />
</tns:manifest>
```

Bundle Operations



The screenshot shows a terminal window titled "Session C - [24 x 80]" with a menu bar (File, Edit, View, Communication, Actions, Window, Help) and a toolbar. The main display area contains the following text:

```
INQ BUNDLE
STATUS: RESULTS - OVERTYPE TO MODIFY
Bun (TEST3 ) Dis Par (00002) Tar (00002) Enabledc (00000)
      Bun (/u/fbohm/bundles/bundle3/ )
Bun (TEST5 ) Ena Par (00001) Tar (00000) Enabledc (00000)
      Bun (/u/fbohm/bundles/bundle5/ )
```

At the bottom of the screen, there is a status line with the following information:

```
RESPONSE: NORMAL
PF 1 HELP 3 END 5 VAR 7 SBH 8 SFH 9 MSG 10 SB 11 SF
```

System information at the bottom right:

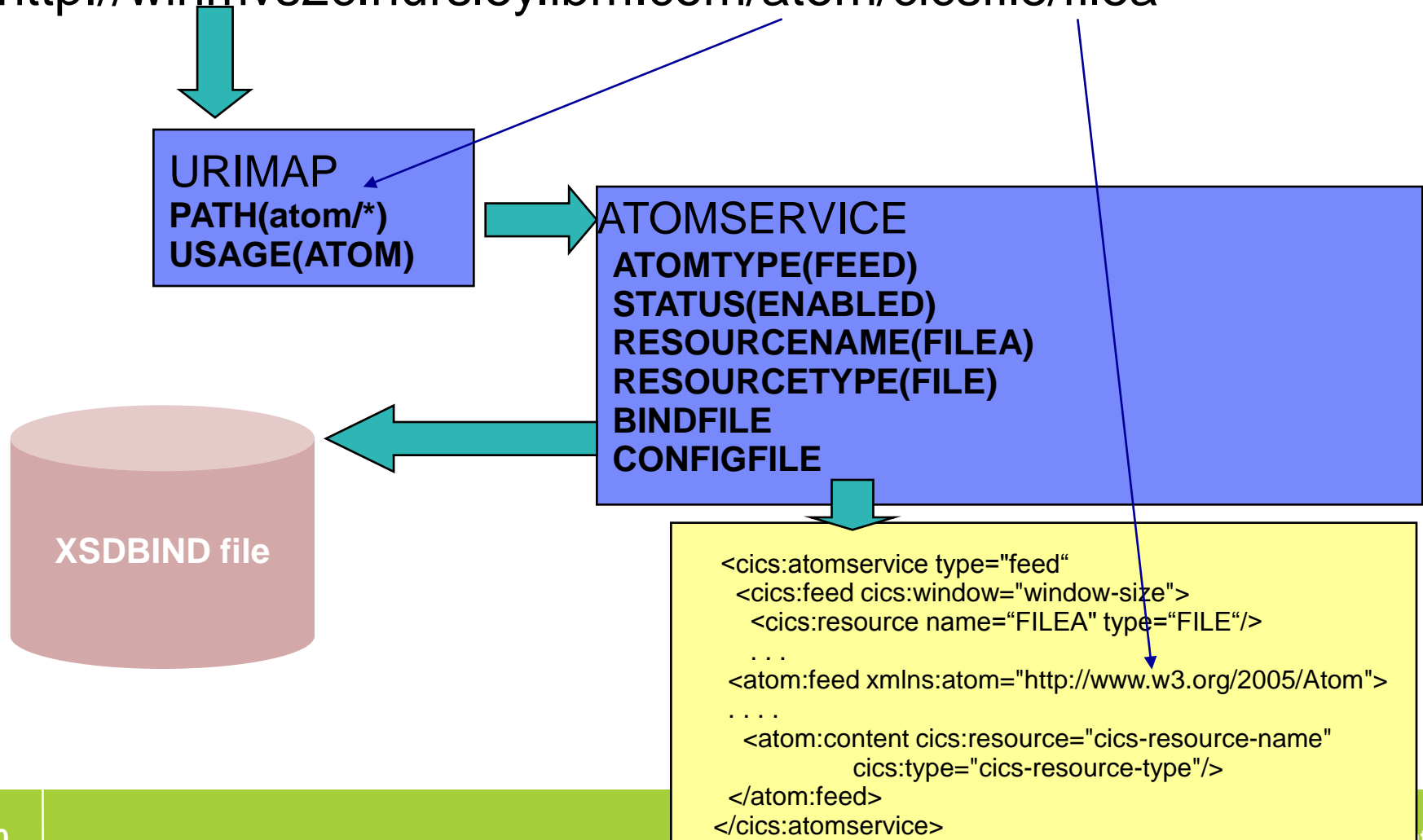
```
SYSID=FRA1 APPLID=IYK3ZBB1
TIME: 12.18.24 DATE: 01/28/09
```

At the very bottom of the terminal window, there is a prompt "MA c" and a timestamp "01/014". A small status bar at the bottom left indicates the connection details: "Connected to remote server/host winmvs2c.hursley.ibm.com using lu/pool IYCWTC01 and port 23".

CICS WEB 2.0 / ATOM Support

ATOM support in CICS TS 4.1

<http://winmvs2c.hursley.ibm.com/atom/cicsfile/filea>



AtomService CONFIGFILE

- Specify the CICS resource attributes of the feed
- `<cics:atomservice type="typevalue">`
 - Root element for an Atom configuration file and the type of Atom document
 - feed, collection, service, category
- For feed documents: `<cics:feed cics:window="window-size">`
 - Specify the number of entries that CICS is to return in each feed document
 - `<cics:resource>` `name="cics-resource-name" type="cics-resource-type">`
 - Specify name and type of CICS resource to be published
 - tsqueue, file
 - Or provide a program to create data from any source
 - DB2, custom data store etc.
 - `<cics:fieldnames>`
 - Identify the CICS resource field names that provide items of metadata

AtomService BINDFILE

- CICS Utility DFHLS2SC
 - Generates an XML schema and an XSD binding file from a language structure
 - XSD bind file will describe the record layout of the CICS resource used as a feed
 - Maps the contents of the TS queue or File record etc. onto the Atom protocol XML.

Systems Programmer Interface for Atom Feeds

- CREATE ATOMSERVICE
- DISCARD ATOMSERVICE
- INQUIRE ATOMSERVICE
- SET ATOMSERVICE
- INQUIRE URIMAP

- New CW2A Transaction ID
 - Alias transaction for Atom feeds

CICS Internal Transport

CICS PIPELINE Internal Transport

- PIPELINE Currently has two transport types based on URI
 - HTTP / HTTPS use HTTP Transport
 - WMQ / JMS use the WMQ Transport
- Adding a CICS Transport that uses internal services rather than the network for CICS <-> CICS service calls
 - New CICS URI Format
- A more flexible version of the local optimization that already exists for Web Services

CICS Transport URI format

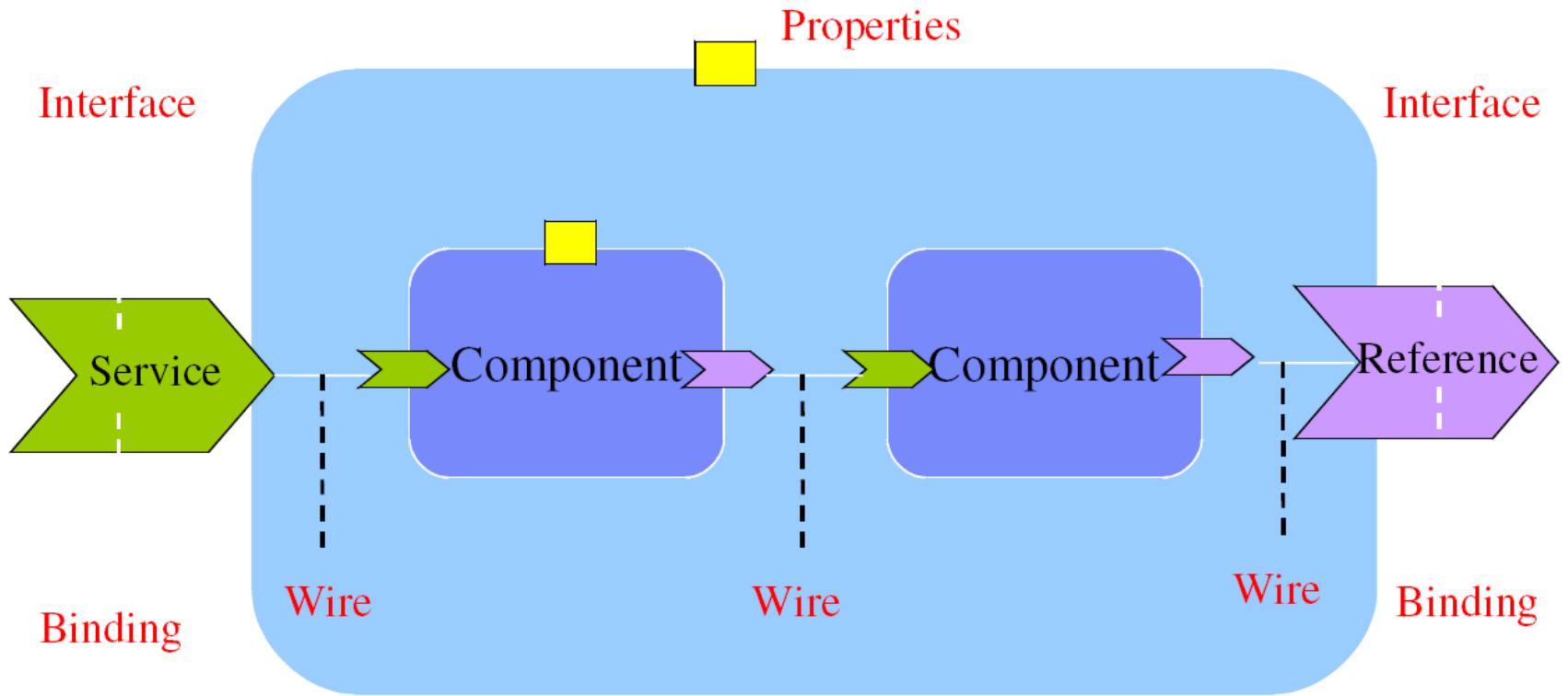
- Have the request target a program
 - `cics://program/MYPROG`
- Have the request target a Service (Provider pipeline)
 - `cics://service/myService?targetService=/myProviderApp/ServiceUri`
- Have the request run a second Requester Pipeline
 - `cics://pipeline/MYPIPE`

Service Component Architecture

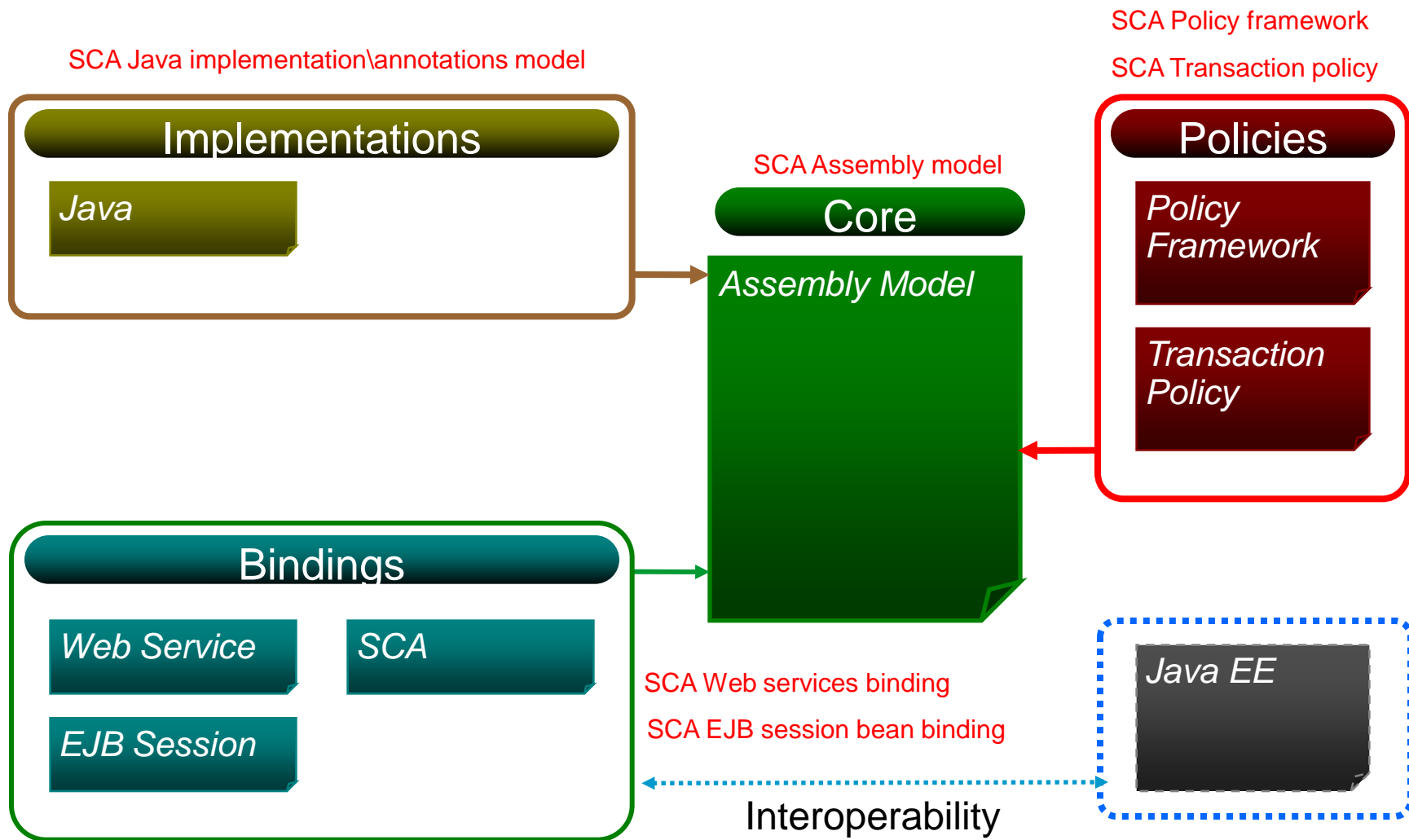
SCA: What it is

- Service Component Architecture.
- A concrete manifestation of an SOA way of thinking.
- Designed for building agile service oriented applications.
- A framework for implementing, assembling, composing and deploying services.
- Supports loose or tight coupling of coarse or fine grained services.
- Extends, exploits and complements existing technologies and standards.
- Language, Application Environment, Framework and Vendor neutral.
- Supports Java and Web Services, and more
- An extensible set of:
 - Protocol bindings (eg. SCA, WS, RMI, ...)
 - Implementation languages (eg. Composite, Java, ...)
 - Interface definitions (eg. WSDL, Java, ...)
 - Pluggable Data bindings (eg. PoJo, JAXB, ...)
 - Policies and Intents (eg. Integrity, Confidentiality).
- “Classic SCA” refers to Service Component Architecture as it is defined and built by IBM supported in a variety of WebSphere Family products starting with V6.
- “Open SCA” refers to Service Component Architecture as defined by the industry at both the OSOA collaboration

SCA Composite



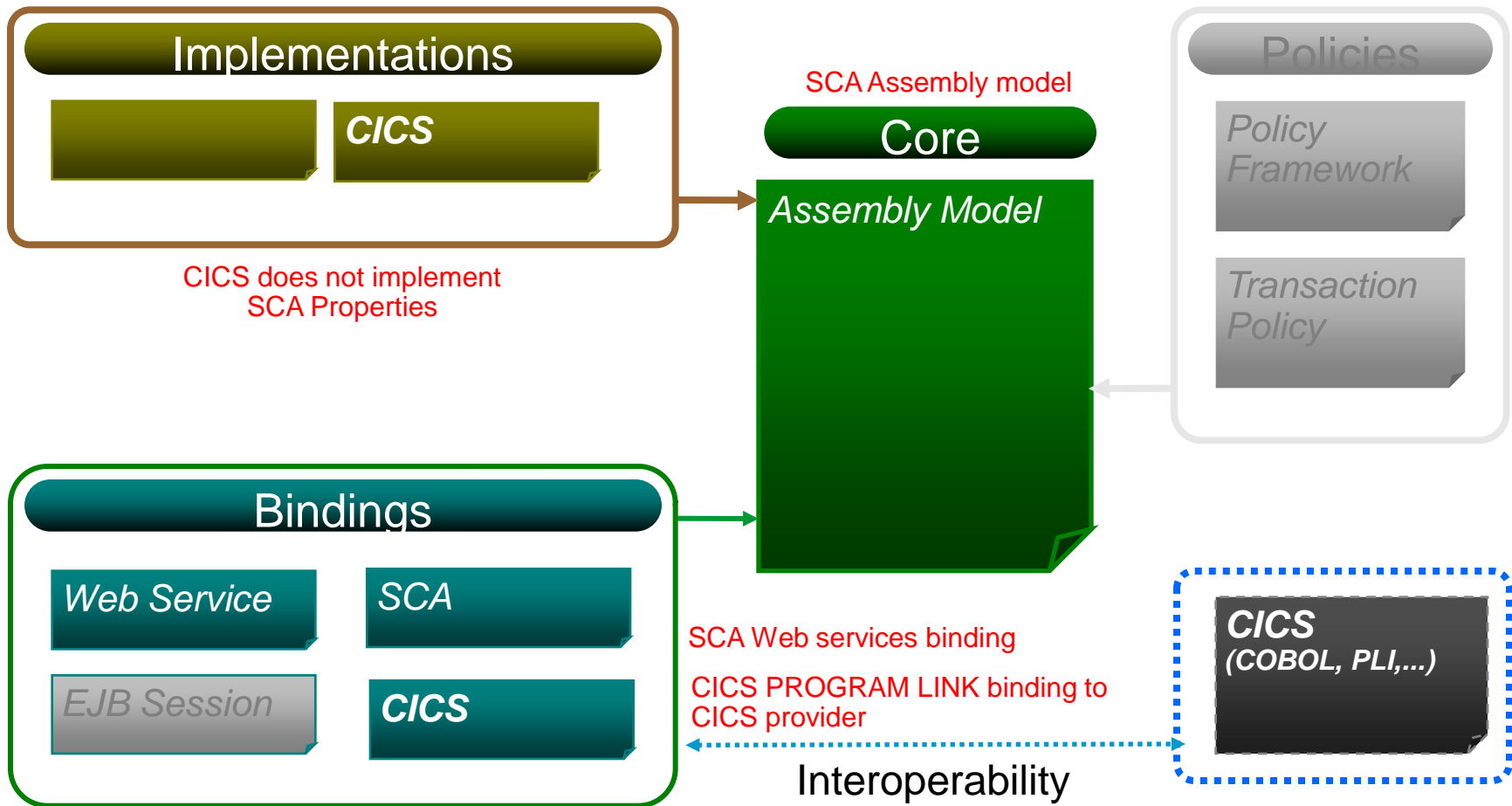
SCA v1.0 Specifications – Flexible & Extensible



CICS TS v4.1 Capabilities

CICS Service provider/consumer model
(Channel & Container with WS-Bind data-mapping,
EXEC CICS INVOKE SERVICE command)

SCA Policy framework
SCA Transaction policy



Summary

Web Services and SCA - Summary

- Web Services Highlights
 - WS-Addressing
 - XMLSS use
 - Data Mapping improvements
 - WSRR support
- Resource Deployment / Life cycle – BUNDLE
- WEB 2.0 / ATOM Support
- CICS PIPELINE Internal Transport
- SCA Support

Questions

- Thank you

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