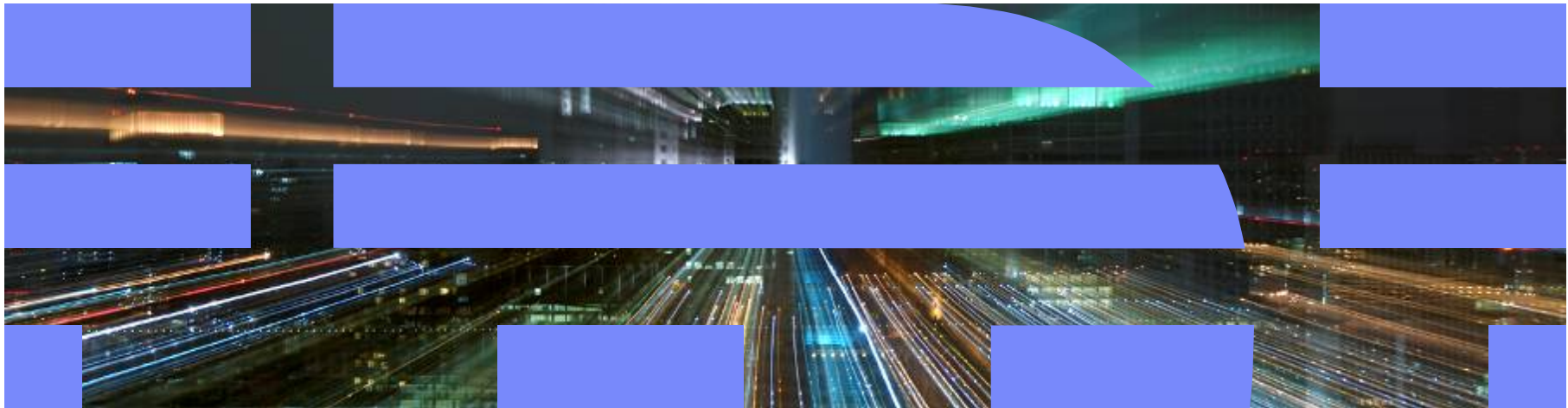# CICS Transaction Gateway

Version 8.1

November 2011

CICS TG V8.1

IBM's statements regarding its plans, directions, and intent are subject to change or withdrawal without notice at IBM's sole discretion. Information regarding potential future products is intended to outline our general product direction and it should not be relied on in making a purchasing decision. The information mentioned regarding potential future products is not a commitment, promise, or legal obligation to deliver any material, code or functionality. Information about potential future products may not be incorporated into any contract. The development, release, and timing of any future features or functionality described for our products remains at our sole discretion.

CICS TG V8.1

Agenda

– What is CICS TG?

– What's new in CICS TG V8.1?

– Reference resources

CICS TG V8.1

CICS Transaction Gateway – The smart choice

'CICS Transaction Gateway delivers smart connectivity for your enterprise'

INTERCONNECTED

Optimised for WebSphere Application Server but **open to all**. CICS TG delivers connectivity for other JEE applications servers, in addition to Unix/Linux and Microsoft® .NET environments

INSTRUMENTED

Systems monitoring delivers improved visibility of workload for greater management of resources, including interoperability with Tivoli Omegamon XE and CICS PA, along with visibility in the CICS Explorer
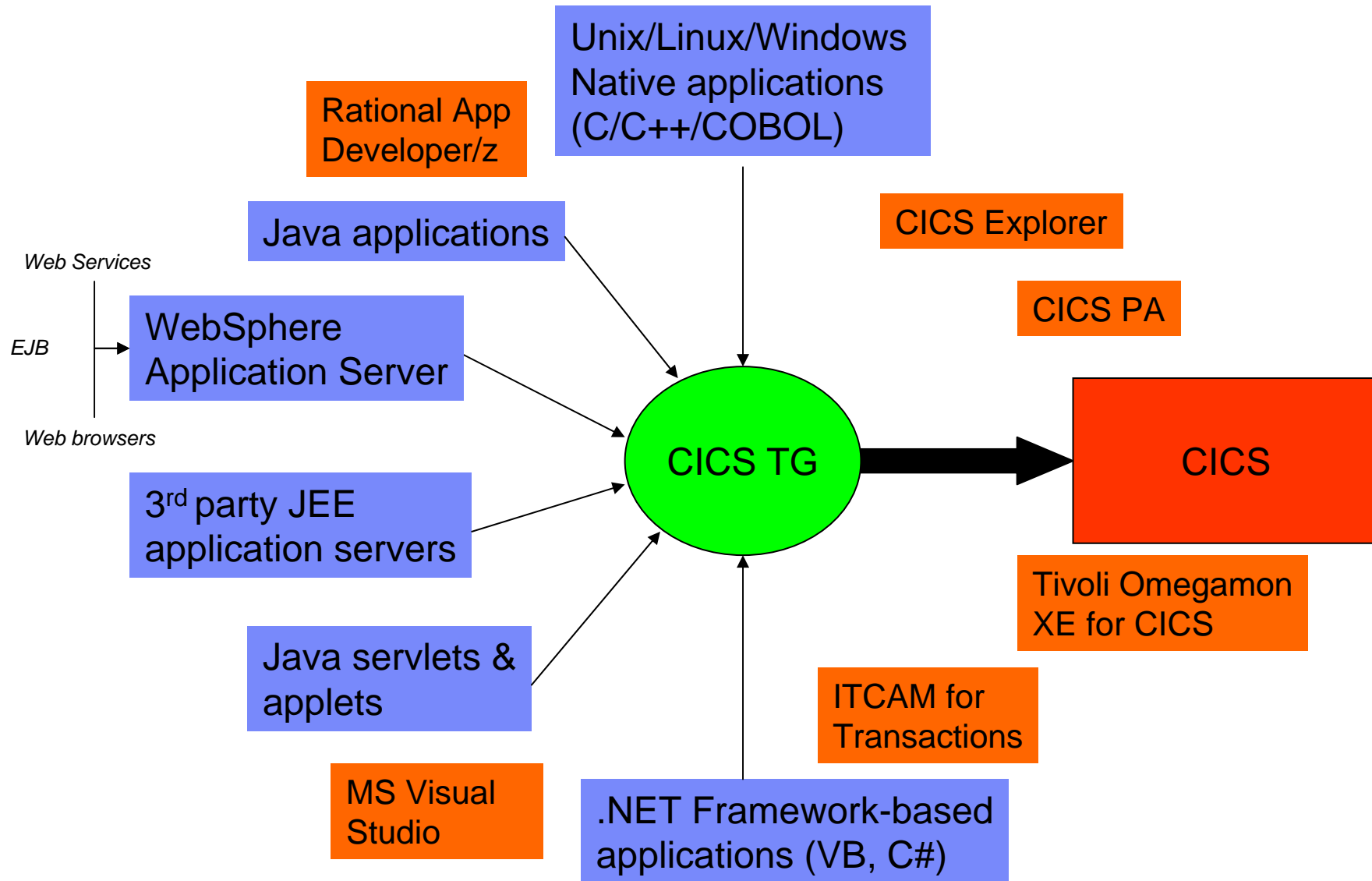
INTELLIGENT

High availability delivers scalability and fail-over support across the IBM System Z Parallel Sysplex

CICS TG V8.1

What is the CICS Transaction Gateway?

Unix/Linux/Windows Native applications (C/C++/COBOL)

Rational App Developer/z

CICS Explorer

Java applications

CICS PA

Web Services

WebSphere Application Server

EJB

Web browsers

CICS TG

CICS

3rd party JEE application servers

Tivoli Omegamon XE for CICS

Java servlets & applets

ITCAM for Transactions

MS Visual Studio

.NET Framework-based applications (VB, C#)

CICS TG V8.1

Integration of CICS with WebSphere, JEE and others

- All in-support versions of CICS Transaction Server & TXSeries products

- All in-support releases of WAS on all platforms (including WAS CE) through JCA resource adapters

- Highly flexible and configurable to suit many possible topologies

- Supports APIs for Java and other languages C/C++, COBOL, Microsoft® .NET Framework (Visual Basic ®, C#)

CICS TG V8.1

Interconnection with CICS

- Primary inbound connector to CICS from multiple platforms

- A server-grade software product capable of multi-user, multi-application connectivity to CICS from local server applications and remote clients

- Non-invasive to existing CICS resources after connection definitions

- CICS connectivity protocols
  - IPIC (All platforms)
  - EXCI (System Z)
  - SNA or TCPIP (Multiplatforms)

CICS TG V8.1

IBM

CICS Transaction Gateway V8.1

Open Integration and modernization

Announce October 4th 2011, GA December 2nd 2011

Extend your CICS assets into more environments than ever!

- **JEE 6 compatible including 64-bit application servers**
  - Support for WebSphere Application Server V8.0
  - Support for OEM JEE 6 certified application servers
  - More flexible deployment options for two-phase commit (XA) transactions

- **APIs suiting many application development needs**
  - Channel/container program support
  - Java applications and applets
  - C applications (also interoperable with C++/COBOL)
  - Microsoft .NET Framework-based applications including 64-bit

- **Integrated with CICS Explorer**

CICS TG V8

Optimized for WebSphere
Open to *all*

- **Scalable high availability**
  - Sysplex wide two-phase commit
  - Configurable Dynamic Server Selection (DSS) on z/OS, available out of the box
  - User exit for DSS on Multiplatforms

- **Security enhancements**
  - Password phrase support with CICS Transaction Server for z/OS V4.2
  - New, improved security APIs (ESI) for Password Expiry Management (PEM)
  - PEM over IPIC, facilitating SNA to TCPIP migration, adding ESI support on z/OS

- **Updated Desktop Edition**
  - Providing an upgrade path to Windows® 7 operating system for CICS Universal Client users
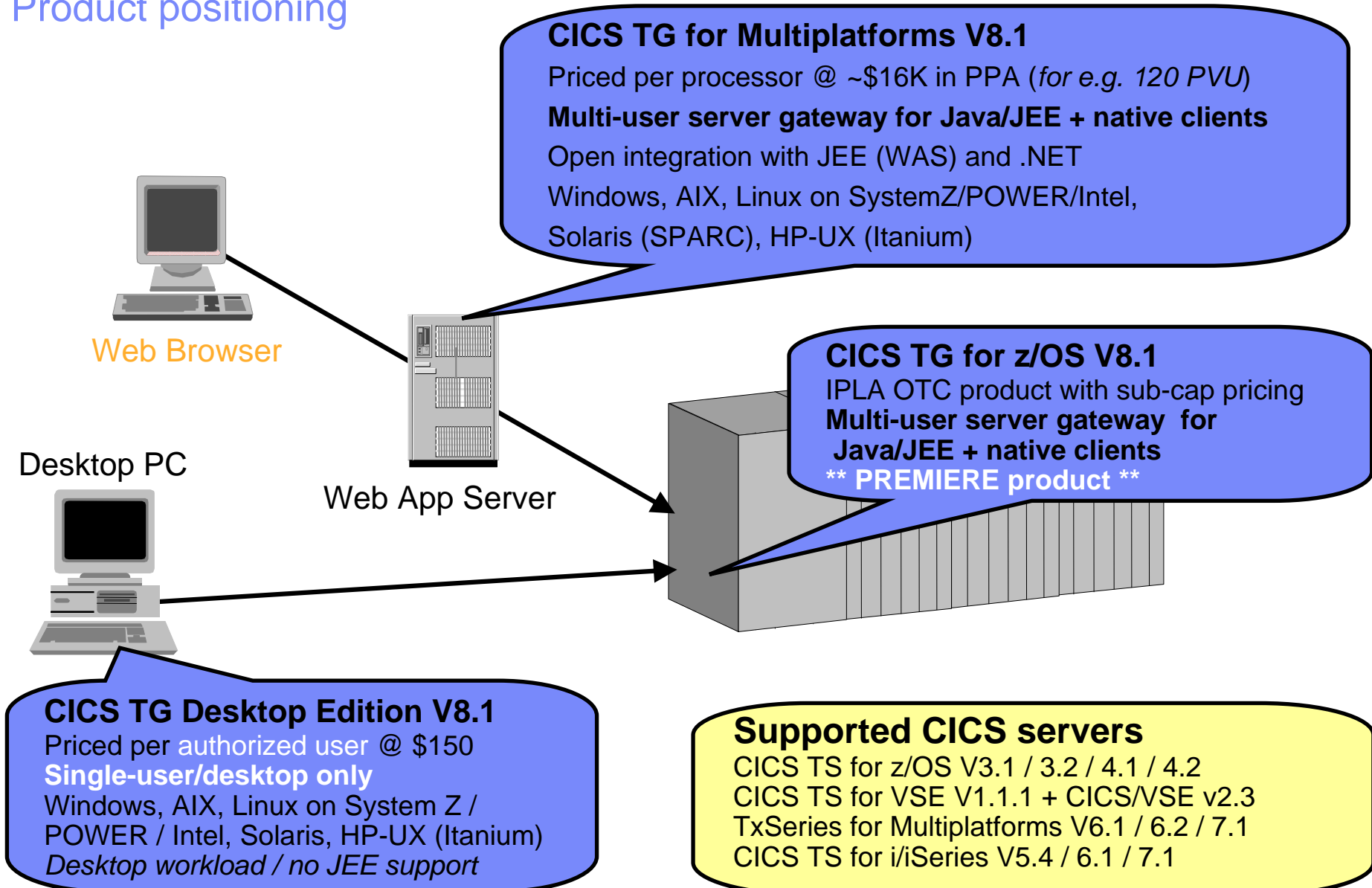 - Further capabilities not available in CUC e.g. Java APIs, statistics, monitoring

8

CICS TG V8.1

IBM

Product positioning

CICS TG for Multiplatforms V8.1

Priced per processor @ ~$16K in PPA (*for e.g. 120 PVU*)

Multi-user server gateway for Java/JEE + native clients

Open integration with JEE (WAS) and .NET

Windows, AIX, Linux on SystemZ/POWER/Intel,

Solaris (SPARC), HP-UX (Itanium)

Web Browser

Web App Server

Desktop PC

CICS TG for z/OS V8.1

IPLA OTC product with sub-cap pricing

Multi-user server gateway for Java/JEE + native clients

** PREMIERE product **

CICS TG Desktop Edition V8.1

Priced per authorized user @ $150

Single-user/desktop only

Windows, AIX, Linux on System Z /
POWER / Intel, Solaris, HP-UX (Itanium)

Desktop workload / no JEE support

Supported CICS servers

CICS TS for z/OS V3.1 / 3.2 / 4.1 / 4.2
CICS TS for VSE V1.1.1 + CICS/VSE v2.3
TxSeries for Multiplatforms V6.1 / 6.2 / 7.1
CICS TS for i/iSeries V5.4 / 6.1 / 7.1

CICS TG V8.1

Availability & Scalability – DSS on z/OS

**Out of the box Dynamic Server Selection**
- An alternative to CICS Request Exit, not a replacement
- No programming skills required, quick and easy to implement
- No application changes required, interoperable with XA transactions
- Integrated with CICS TG statistics and monitoring

New Gateway daemon configuration options on z/OS
- New configuration file sections `DSSGroups`, `DSSPolicies`
- A `DSSGroup` defines a lists of CICS servers, and a selection algorithm
    - The selection algorithm can be `RoundRobin` or `FailOver`
- A DSSPolicy maps application requests to a DSSGroup
- Logical Servers are now deprecated; migrate to the new syntax

CICS Request Exit still provides maximum flexibility for more complex routing decisions, allowing custom written server selection logic

CICS TG V8.1

CICS TG for z/OS V8: HA/XA support with DSS

V8 for z/OS allows Dynamic Server Selection with XA
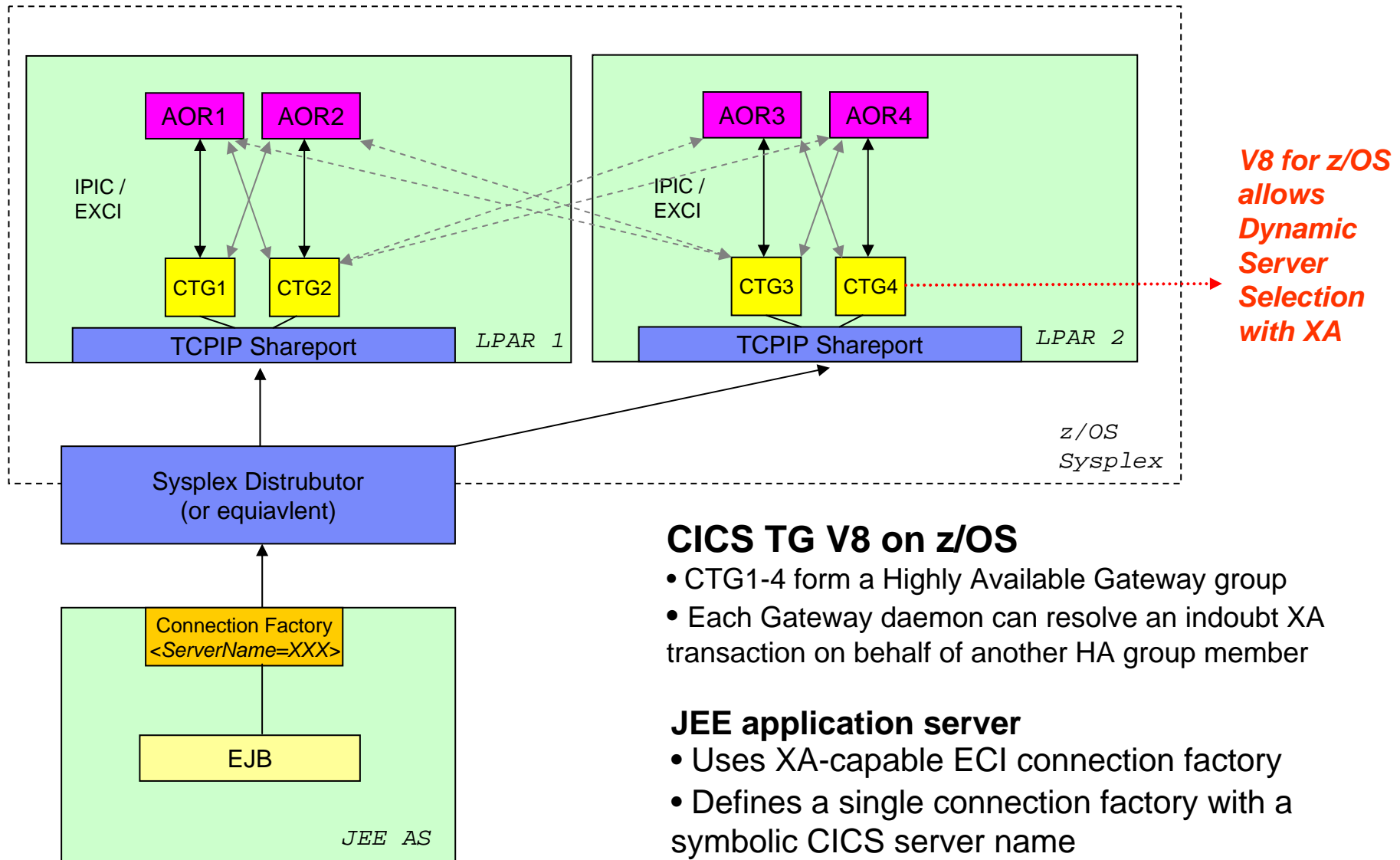
CICS TG V8 on z/OS
- CTG1-4 form a Highly Available Gateway group
- Each Gateway daemon can resolve an indoubt XA transaction on behalf of another HA group member

JEE application server
- Uses XA-capable ECI connection factory
- Defines a single connection factory with a symbolic CICS server name

CICS TG V8.1

Availability & Scalability – DSS on z/OS example configuration

```
SECTION GATEWAY
  . . .
  DSSPolicy=HAPOLICY1
. . .
ENDSECTION

SECTION DSSPOLICY = HAPOLICY1
  SUBSECTION MAPPINGS
    IPICHA=GROUP1
    <NONE>=GROUP2
    <ANY>=GROUP3
  ENDSUBSECTION
ENDSECTION

SECTION DSSGROUP = GROUP1
  Servers=IPICTOR1,IPICTOR2
  Algorithm=ROUNDROBIN
ENDSECTION

SECTION DSSGROUP = GROUP2
  Servers=CICSTOR3,CICSTOR4
  Algorithm=ROUNDROBIN
ENDSECTION

SECTION DSSGROUP = GROUP3
  Servers=CICSTOR3,CICSTOR4,CICSTOR5
  Algorithm=FAILOVER
ENDSECTION
```

All requests to **IPICHA** get balanced 50/50 across IPICTOR1 and IPICTOR2

<**NONE**> All requests that don't specify a server get balanced across CICSTOR3 and CICSTOR4

<**ANY**> All other requests get send to CICSTOR3 but will failover to CICSTOR4, CICSTOR5 in that order

CICS TG V8.1

User exit based Dynamic Server Selection added to Multiplatforms

– New Dynamic Server Selection capability for Multiplatforms is added in V8.1 through inclusion of the CICS Request Exit

– Provides DSS for applications using *remote mode* ECI and ESI
  • Java base classes, JCA (ECI), ECI Version 2, CICS TG .NET API
  • CICS connection using protocols SNA, ECI/TCPIP, IPIC
  • Supports channel and container ECI requests with IPIC
  • Allows dynamic interaction through the command line interface

– Strategic replacement for older Client daemon C-language user exits

– Compatible with Support Pac CA1T, providing rich DSS options

  Note: *No XA in remote mode, or IPIC SSL for MP remote mode*

CICS TG V8.1

Availability & Scalability – DSS for Multiplatforms
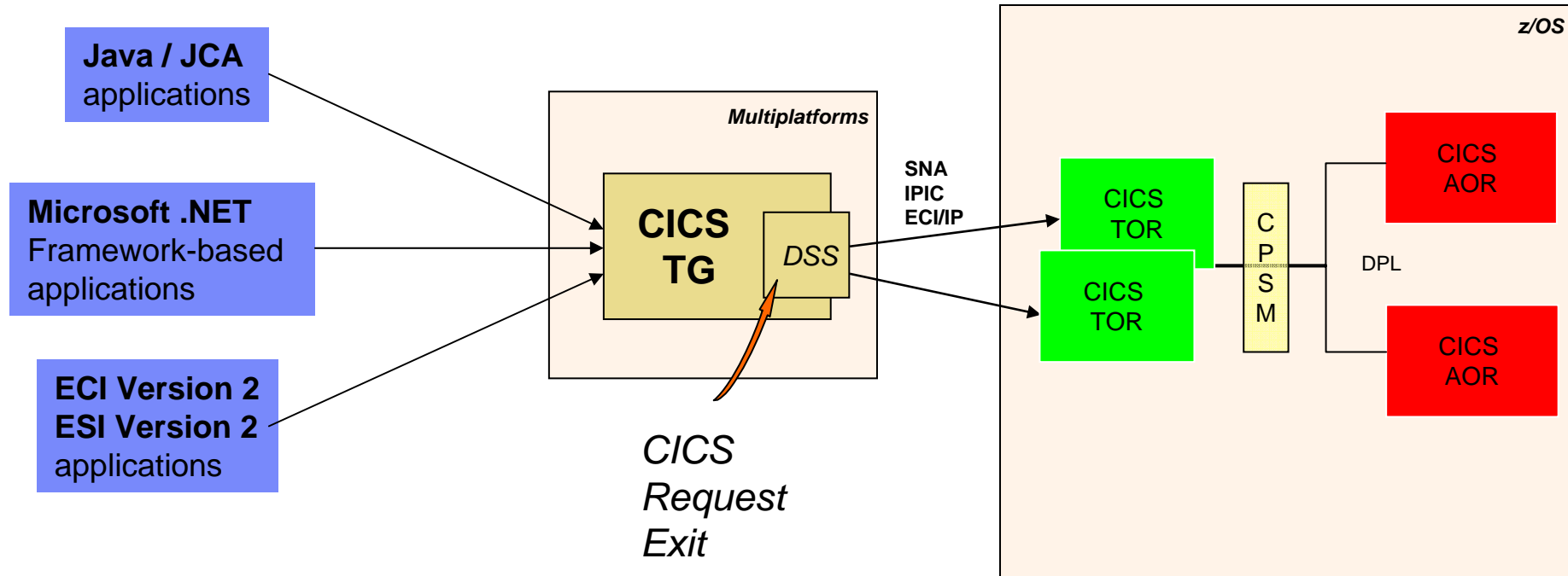
CICS Request Exit configuration

- –Specify CICS Request Exit Java class in GATEWAY section

```
cicsrequestexit=com.ibm.ctg.samples.ha.FailOverExit
```

CICS TG V8.1

IPIC connection lifecycle improvements
- When a CICS region is unreachable through IPIC, `connecttimeout` (default 60 seconds) must elapse between each connection attempt
- Each application requests for the same IPIC connection queues, leading to cumulative response times
- Time to failover in HA topologies can be unacceptable

New IPIC connection property
- Server retry interval specified in seconds, per IPIC connection definition via new keyword `SrvRetryInterval`
- Shortcut for requests serially queuing for `connecttimeout`
- Equalize response times for queuing requests during a failure window
- Permits a shorter time to failover in HA topologies

CICS TG V8.1

Availability & Scalability – IPIC connection lifecycle
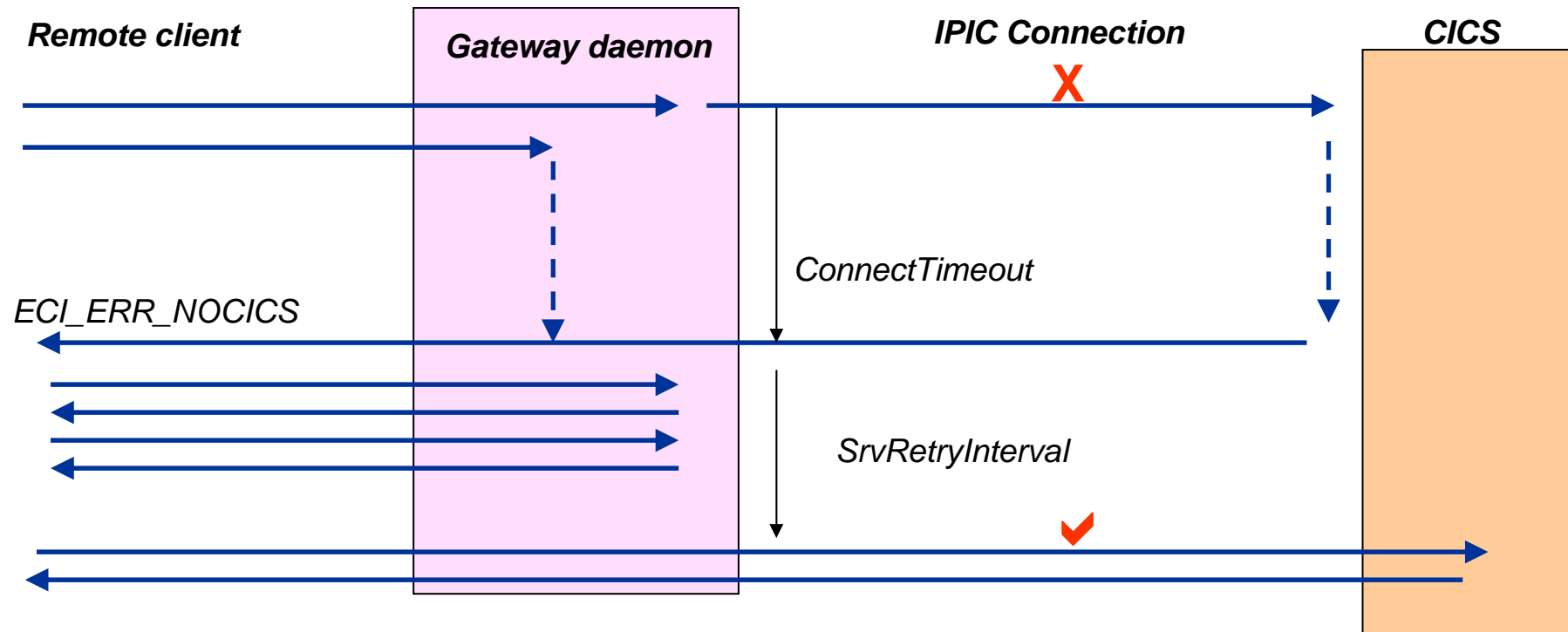
CICS TG V8.1

Cloud integration – IBM Workload Deployer V3
- IBM Workload Deployer now includes support for CICS connectivity
- JEE Enterprise Applications requiring access to CICS are composed visually, using MQ, WebServices or CICS TG for connectivity
- Enterprise Applications deployed into the cloud benefit from elastic scalability, maximising efficient use of resources

Example Cloud/CICS topology:

CICS TG V8.1
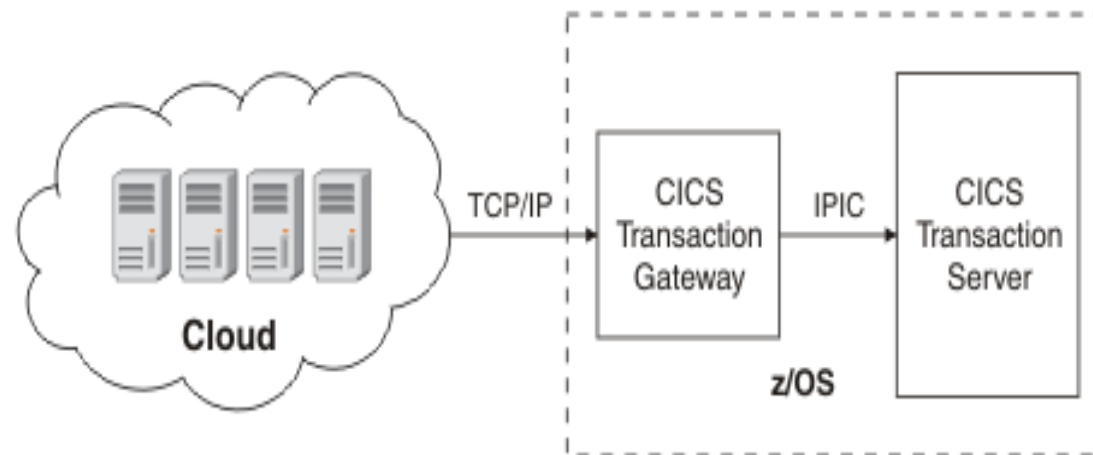
Open platform integration – Microsoft .NET Framework

Run time improvements for Microsoft .NET Framework
- The CICS TG .NET API is now **fully interoperable with 32- and 64-bit** applications, and runs purely in "managed mode"
- The run time dependency upon the ECI Version 2 run time library **(ctgclient.dll)** has been removed

Improved CICS TG API for Microsoft .NET Framework
- ECI requests now formally support CICS channels and containers
  - Relief from the 32KB COMMREA limit
- ESI requests now available for Password Expiry Management
- ECI and ESI requests include support for password phrases, for use with CICS TS for z/OS V4.2

CICS TG V8.1

Open platform integration – JEE 6

CICS TG support for Java Enterprise Edition 6
- The CICS connectors included with CICS TG V8.1 exploit JEE 6 / JCA 1.6

- JEE 6 certified application servers (e.g. WAS 8.0) benefit from
  - A single ECI resource adapter (*rather than two*) including support for both XA (two-phase commit) and non-XA transactions
  - A more flexible approach to setting the transactional capabilities of the CICS ECI resource adapter
  - Lower administrative and maintenance overheads

- Resource adapters compatible with JEE 5 (or earlier) application servers are available use with CICS TG V8.1 in <u>remote mode only</u> from Support Pac CC03

CICS TG V8.1

IT Simplification – Usability improvements

Usability improvements for z/OS configuration
– The Gateway daemon on z/OS can now read configuration from a Partition Dataset member, or as a sequential dataset, as well as Unix System Services (zFS / HFS)

– Allows JCL, environment variables and configuration data to be stored within a single PDS if desired – encapsulating all CICS TG for z/OS configuration data and related JOBs in a single location

– Easier to review, manage, apply version control, backup or duplicate Gateway daemon configurations

Logging improvements
– The Gateway daemon can now be configured to log CICS error messages returned over IPIC connections

CICS TG V8.1

IT Simplification – Usability improvements

Help on CICS TG warning and error messages
- Assistance for Multiplatforms administrators
- Delivered through the "`ctgadmin`" command line utility
- Similar to CMAC transaction on CICS
- Provides NLS enabled help text, including
  - Identification of the message inserts, where applicable
  - An explanation of the message
  - The system response to the message
  - The user response to the message

CICS TG V8.1

IT Simplification – Security improvements

Microsoft .NET

Java

ESI Version 2

TCP

CICS TG Gateway daemon

IPIC or SNA

CICS server
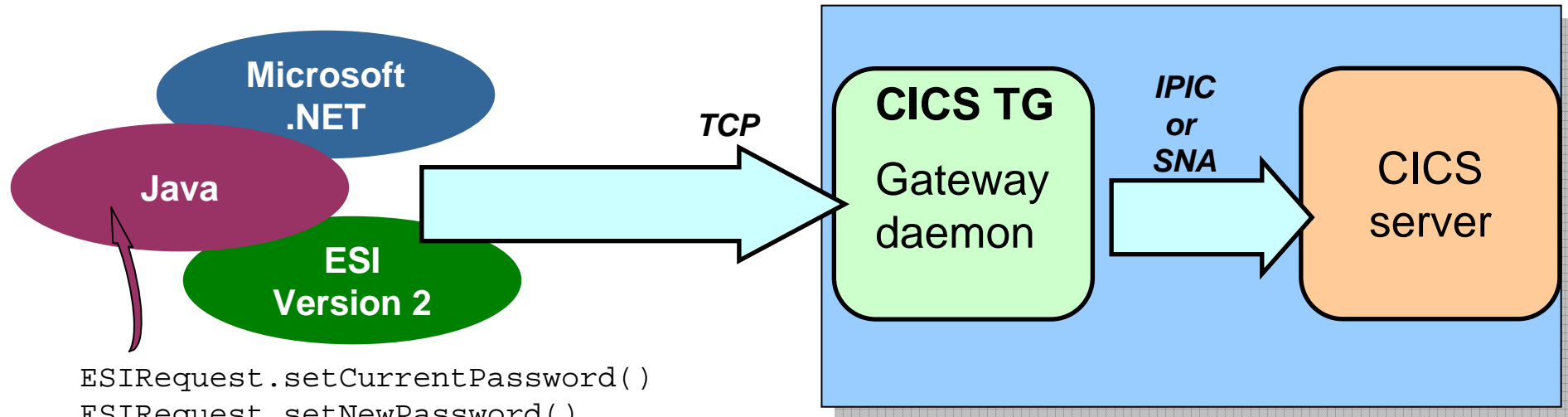
```
ESIRequest.setCurrentPassword()
ESIRequest.setNewPassword()
ESIRequest.setServer()
ESIRequest.setUserid()
```

**External Security Interface (ESI) support with IPIC**

- The ESI API provides Password Expiry Management (PEM) facilities to remote applications needing secure access
- Local or remote mode support for Java base classes
- IPIC gives ESI support to CICS TG for z/OS for the first time
- **Requires an IPIC connection** to CICS TS for z/OS V4.1, or later

*Note: Prior to V8.1, only the Multiplatforms products supported ESI with SNA APPC connections*

# CICS TG V8.1

## IT Simplification – Security improvements
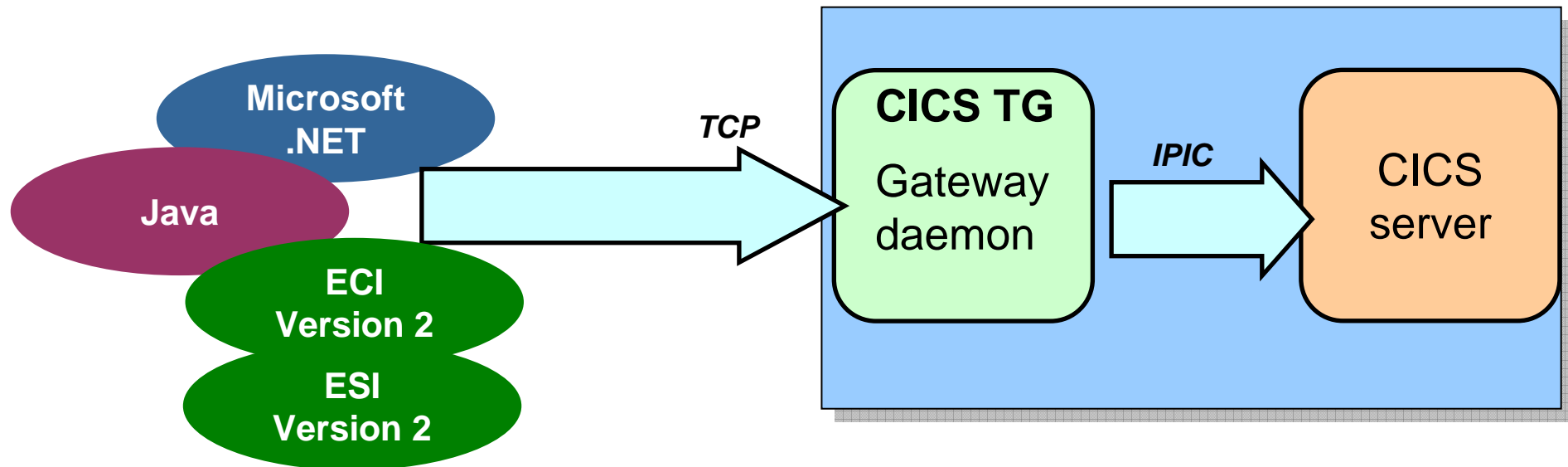


**Password phrase support**
- ECI and ESI APIs are enhanced to support password phrases
- Available for Java base classes, JCA, ECI Version 2, ESI Version 2 and Microsoft .NET Framework applications
- **Requires an IPIC connection** to CICS TS for z/OS V4.2

# CICS TG V8.1

IT Simplification – Monitoring and statistics

**Enhanced request monitoring for ECI Version 2 and .NET APIs**
- Added ability to set client APPLID qualifier and APPLID
- Assist monitoring of requests by application instance
- Assist correlation of CICS tasks to application requests when using IPIC connections and task association data, Origin Descriptor Record (ODR)

**New statistics**
- Protocol handler (PH) bind address
  - **PH_SBINDTCP, PH_SBINDSSL**
  - Useful for multi-stack TCPIP configurations where Gateway daemon protocol handlers might be bound to a specific address
- Gateway daemon (GD) I/O average response time
  - **GD_LAVRESPIO, GD_IAVRESPIO**
  - Useful for identifying network latency in overall response times

# CICS TG V8.1

IT Simplification – ECI Version 2 and .NET identification

## Client APPLIDQ and APPLID

*New in V8.1*

ECI Version 2 and .NET applications can now identify themselves programmatically, or by configuration:
- –Environment variable for ECI Version 2
- –Application configuration file for .NET Framework

*New in V8.1*

V8.1 makes Origin Data visible with request monitoring in Java clients in local or remote mode

**Java Client**

E1

E2

**Protocol Handler**

E1

E2

Request monitoring exit point

Request monitoring exit point

**Gateway daemon**

EXCI
IPIC
SNA

**Mirror Task**

**CICS**

### Task Association (0015448)

Task Association (0015448)

SDAYPEG ▸ IYK2Z32C ▸ 0015448

**Attributes**

| Property | Value |
|---|---|
| ⊿ Basic | |
| Appl Data | DFHIIYK2Z32CCISSIPIC   GP... |
| Appl ID | IYK2Z32C |
| CICS Release | E670 |
| Client IP Address | 9.20.138.199 |
| Client IP Format | IPV4 |
| Client Port | 13428 |
| Cluster Conn Type | 0000000000000000000000000... |
| Facility Name | /A9X |
| Facility Type | IPIC |
| Initiating User ID | |
| IPCONN Resource | GPW6 |
| MVS Image | MV2C |
| Net ID | CTGPWNET |
| Odaptrdata 1 | |
| Odaptrdata 2 | |
| Odaptrdata 3 | |
| Odaptrid | |
| Origin Appl ID | CLIAPPL |
| Origin Appl ID Net ID | CLINET |
| Origin Facility Name | |
| Origin Facility Type | UNKNOWN |
| Origin IP Address | 9.20.213.183 |

**Client APPLID fields in origin data in Explorer Task association view**

25

© 2011 IBM Corporation

# CICS TG V8.1

## IT Simplification – Monitoring and statistics
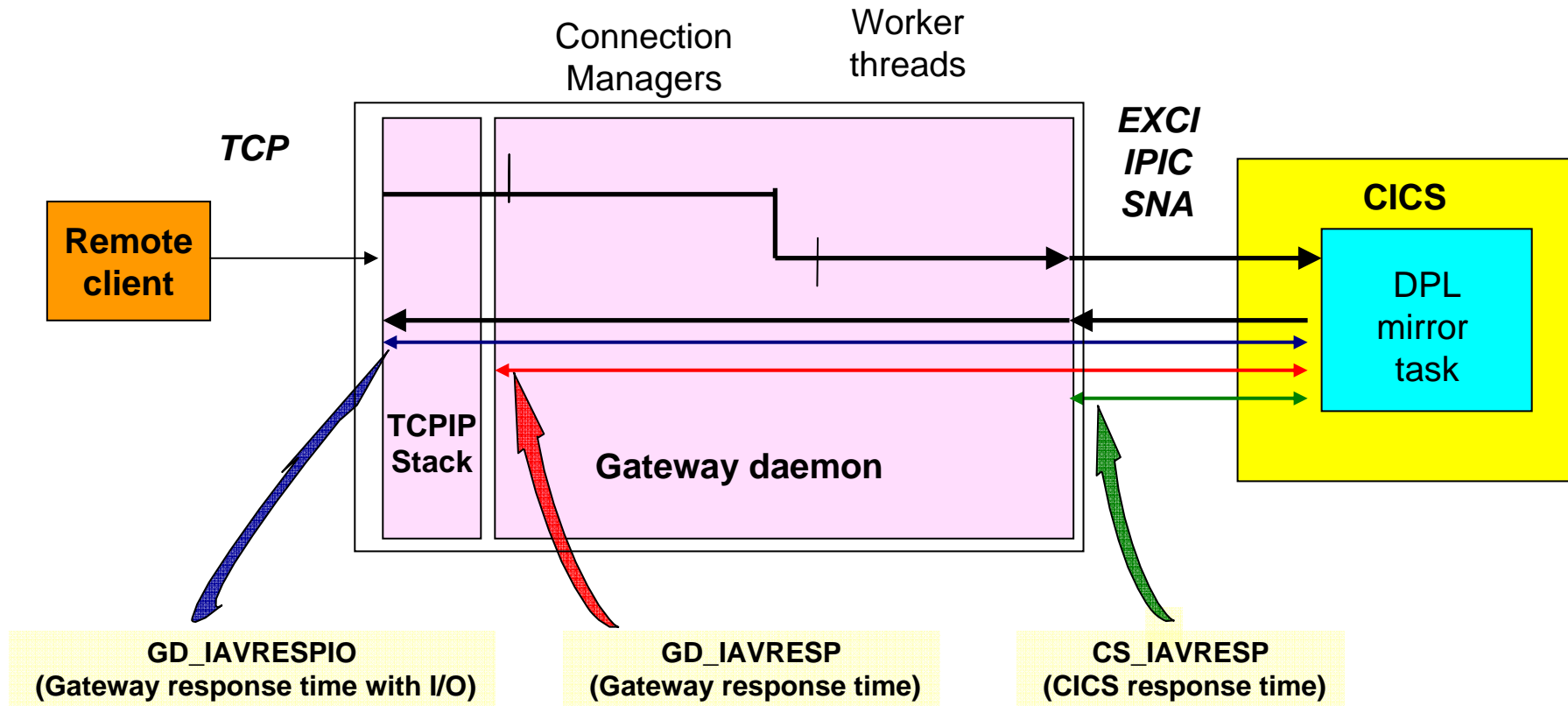


**New statistics**
- Gateway daemon (GD) I/O average response time
  - `GD_LAVRESPIO, GD_IAVRESPIO`

# CICS TG V8.1

IT Simplification – CICS Explorer integration

**Enhanced CICS TG plug-in for CICS Explorer**
- Updated to include latest statistics for V8.1
- Improved connection administration
  - Import/export of CICS TG connection definitions
- User defined Gateway groups
  - Alternative to automatic grouping my APPLID qualifier
  - Useful for providing a common view to all CICS Explorer users
- Sortable columns in Gateways and Connections views
- Enhanced Gateway daemon and CICS connection tests
  - Addresses potential issues related DNS resolution issues, especially with multiple TCPIP stacks on z/OS

# CICS TG V8.1

IBM

## IT Simplification – CICS Explorer integration

Column Sorting

Enhanced Gateway daemon test

Latest CS and GD statistics

User defined Gateway groups

Improved connection administration

# CICS TG V8.1

## Resources & Support

# CICS TG V8.1

**IBM**

## Resources & Support

**CICS TG on-line information centres** *(live December 2nd, 2011)*

- z/OS: http://publib.boulder.ibm.com/infocenter/cicstgzo/v8r1/index.jsp

- MP: http://publib.boulder.ibm.com/infocenter/cicstgmp/v8r1/index.jsp

    *Scenario sections provide useful example topologies with config details*

**ITSO Redbooks**
- The Value of IBM System z and z/OS in an SOA, **REDP4152**
- z/OS Identity Propagation, **SG24-7850** *(draft)*
- Using CICS Transaction Gateway with High Availability and the CICS Explorer, **REDP4782** *(available soon)*
- Architecting Access to CICS within an SOA, **SG24-5466**
- Developer Connector Applications for CICS, **SG24-7714**
- CICS TG V7.1 Systems Monitoring, **SG24-7562**
- CICS TG for z/OS V6.1 (XA, WAS z/OS, security), **SG24-7161**
- J2C Security on z/OS, **REDP4202**

# CICS TG V8.1

**IBM**
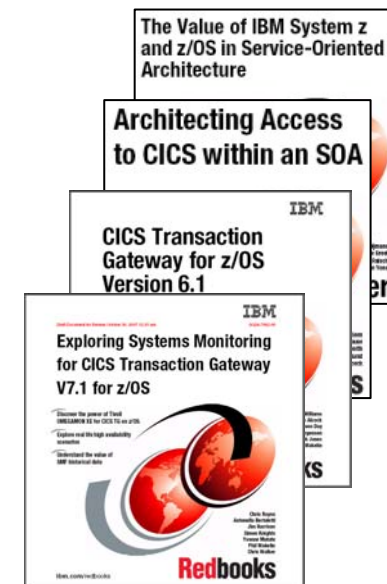
## Resources & Support

### CICS TG Version 8.1 Announcement letter ENUS211-357

http://tinyurl.com/cicstg81announce

### CICS TG Version 8.1 Datasheet GI13-0561

http://tinyurl.com/cicstg81datasheet

### Whitepapers

"*IBM CICS IP interconnectivity: New features in Version 4.2*"
ftp://public.dhe.ibm.com/software/htp/cics/pdf/CICS_TS_V4.2_Connectivity_paper_final.pdf

"*Delivering quick access to CICS systems using strategic integration options*"
http://publib.boulder.ibm.com/infocenter/ieduasst/stgv1r0/topic/com.ibm.iea.cicsts/cicsts/3.1z/Resources/G224-7557-00.pdf

"*Integrating WebSphere Application Server and CICS using the JCA*"
ftp://ftp.software.ibm.com/software/htp/cics/pdf/WSW14013-USEN-00.pdf

"*Transactional integration of WebSphere Application Server and CICS with the JCA*"
ftp://ftp.software.ibm.com/software/htp/cics/pdf/WSW14013-USEN-00.pdf

# CICS TG V8.1

## Resources & Support

### CICS Transaction Gateway articles

"Accessing CICS from Microsoft .NET applications using CICS Transaction Gateway"

http://www.ibm.com/developerworks/websphere/library/techarticles/1012_crockett/1012_crockett.html

"Exploiting the J2EE Connector Architecture: Integrating CICS and WebSphere Application Server using XA global transactions"

http://www.ibm.com/developerworks/websphere/techjournal/0607_wakelin/0607_wakelin.html

"High Availability Using CICS Transaction Gateway and CICS Transaction Server"

http://www.mainframezone.com/it-management/high-availability-using-cics-transaction-gateway-and-cics-transaction-serve

"CICS and Identity Propagation: Solving the End-to-End Security Challenge"

http://www.mainframezone.com/cics-websphere/cics-websphere-system/cics-and-identity-propagation-solving-the-end-to-end-security-challenge/P5

"Peering Into the IBM CICS Transaction Gateway Black Box"

http://www.mainframezone.com/it-management/peering-into-the-ibm-cics-transaction-gateway-black-box

# CICS TG V8.1

## More Resources & Support

www.ibm.com/cics/ctg

### CICS Transaction Gateway

+ Add to My interests

**CICS Transaction Gateway 8.0**
**Now available**

Continuous Innovation Creates Success

#### Overview

CICS Transaction Gateway (CICS TG), is IBM's market-leading Enterprise connector, production proven in over a thousand customers for enterprise modernization of CICS assets..

Download CICS Transaction Gateway Datasheet

CICS TG delivers a high-performing, security-rich, and scalable method of SOA access to CICS, requiring minimal changes to CICS and usually no changes to CICS applications. This allows easy connectivity from a wide variety of environments, including Java, C, Microsoft .NET and COBOL runtimes.

- Allows the reuse of existing CICS applications as services in comprehensive and sophisticated JEE and Web services solutions hosted on powerful application servers. Optimized for WebSphere Application Server, Utilizing the J2EE™ Connector Architecture (JCA), Version 1.5 to manage connections, transactions and security.
- Delivers JEE standards-based access to CICS applications, while requiring minimal changes to CICS and usually no changes to existing CICS applications.
- Supported connector access to CICS applications from a wide variety of environments, including Java, C, Microsoft .NET and COBOL runtimes.
- Delivers open integration for 3rd party Java Enterprise Edition (JEE) Application Servers, along with the addition of channels and containers for the External Call Interface (ECI) V2 API, for the delivery of larger payloads and further support for deployment in .NET environments.
- Improvements made to high availability, ensuring confidence in system up-time along with support for Java 6, and improved Integration with CICS TS V4.1 for enhanced security through ID propagation and interoperability with the CICS Explorer.

- **Website is the best place for up to date information:**

  ▶ Announcement Letters
  ▶ Datasheets/Brochures
  ▶ Redbooks
  ▶ Whitepapers
  ▶ Presentations
  ▶ Technical Library
  ▶ APAR RSS feed
  ▶ And more….

### CICS TG Strategy & Planning

rcjones@uk.ibm.com
+44 (0)1962 818588

# CICS TG V8.1

Reference resources

# CICS TG V8.1

## CICS TG V8.1 - Supported hardware

- – IBM System z® machine supported by z/OS or Linux®
- – 32-bit or 64-bit IBM System p® supported by IBM AIX® or Linux
- – 32-bit or 64-bit Sun SPARC system supported by Oracle Solaris Operating Environment
- – 32-bit or 64-bit HP PA-RISC 1.1 or 2.0 system supported by HP-UX
- – 64-bit HP Itanium® system supported by HP-UX
- – Intel® Pentium®, AMD Opteron or Intel EM64T system supported by Windows operating system or Linux

# CICS TG V8.1

## CICS TG V8.1 - Supported operating systems

- z/OS V1.11 or later
- AIX V5.3 (32-/64-bit kernel), AIX V6.1, AIX V7.1 (64-bit kernel)
- Linux on System z: RHEL 5, SLES 10, SLES 11 (64-bit kernel)
- Linux on Intel: RHEL 5, RHEL 6, SLES 10, SLES 11 (32-/64-bit kernel)
- Linux on POWER® RHEL 5, RHEL 6, SLES 10, or SLES 11 (64-bit kernel)
- Sun Solaris V10 (32-/64-bit kernel)
- HP-UX11i V2 or V3 (32-/64-bit kernel)
- Windows Vista (32-/64-bit kernel) including Business, Enterprise and Ultimate editions
- Windows 7 (32-/64-bit kernel) including Business, Professional, Enterprise and Ultimate editions
- Windows 2008, and Windows 2008 R2 (32-/64-bit kernel) including Standard, Enterprise and Datacenter editions

  *Note: Standard edition includes Windows Small Business Server*

# CICS TG V8.1

CICS TG V8.1 - CICS server support

- CICS Transaction Server for z/OS V3.1, or later
- CICS Transaction Server for z/OS V4.1, or later
- TXSeries for Multiplatforms V6.1, or later
- TXSeries for Multiplatforms V7.1, or later
- CICS/VSE V2.3
- CICS Transaction Server for VSE V1.1.1
- CICS Transaction Server V5.4 for i5/OS, or later
- CICS Transaction Server V6.1 for iSeries, or later
- CICS Transaction Server V7.1 for i, or later

# CICS TG V8.1

## CICS TG V8.1 - JEE Application Server support

– IBM WebSphere Application Server V7.0
– IBM WebSphere Application Server V8.0
– IBM WebSphere Community Edition
– Other JEE application servers. Use the Installation Verification Test (IVT) provided with CICS Transaction Gateway V8.1 to check whether a specific JEE application server can be used. Examples:
  • Oracle Glassfish Server
  • Oracle WebLogic Server
  • JBOSS Application Server *(Redhat)*
  • Apache Geronimo *(unbadged WAS CE)*

*CICS Transaction Gateway Desktop Edition <u>does not</u> include JEE support*

# CICS TG V8.1

For a list of IBM trademarks see the url at: http://www.ibm.com/legal/copytrade.shtml

- – Java and all Java-based trademarks and logos are trademarks or registered trademarks of Oracle in the United States and/or other countries.
- – WebLogic Server and all WebLogic trademarks and logos are trademarks or registered trademarks of Oracle in the United States and/or other countries.
- – GlassFish Server and all GlassFish trademarks and logos are trademarks or registered trademarks of Oracle in the United States and/or other countries.
- – JBoss Application Server and all JBoss trademarks and logos are trademarks or registered trademarks of Red Hat in the United States and/or other countries.
- – Microsoft, Windows, Windows Vista, Visual Studio, Visual Basic are trademarks of the Microsoft Corporation in the United States and other countries.