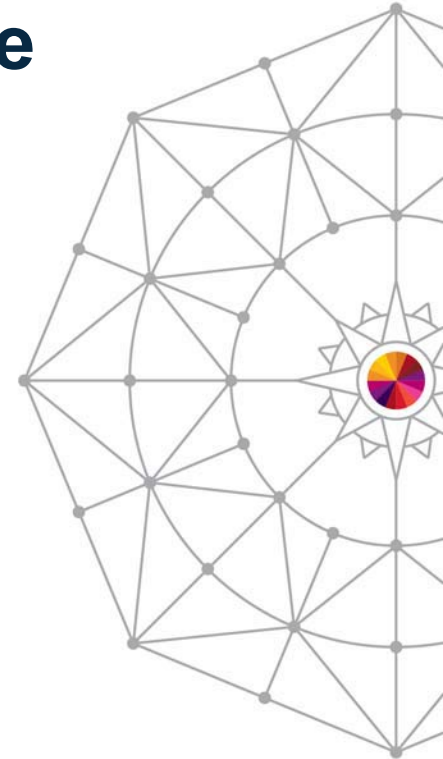


# 15884: Using Policies to Manage Critical CICS Resources

*Matthew Webster, IBM*



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# Abstract

CICS V5 introduces significant capability to help manage CICS as a private cloud. The Platform definition can monitor the health of shared services and maintain consistency across regions simplifying application deployment while threshold policies can protect production systems against rogue applications by enforcing coding standards throughout the development lifecycle. See how to use these new resources in conjunction with existing facilities including CICS Monitoring and tools like CICS PA to manage and measure the health of your CICS environment. This session will cover recent enhancements to CICS including support for deploying and managing shared services such as TCP/IP connectivity, web services resources and Java runtimes as part of a Platform. Customers using workload management will discover how Application context information can now assist with dynamic routing. We will also describe the new threshold policies.

# CICS Cloud and CICS Tools Sessions

- Monday
  - **15855: Modernizing CICS for Cloud**
- Wednesday
  - **15552: Modernizing CICS - Hands-on Lab Parts 1 & 2**
  - **15882: Managing Multi-version Applications in CICS**
- Thursday
  - **15883: CICS Futures Interactive Discussion**
  - **15884: Using Policies to Manage Critical CICS Resources**
  - **15559: CICS Question Box and Pot Luck**

# Topics

- CICS Platform
- CICS Threshold Policy
- CICS Tools

# CICS Cloud “Toolbox”

- **Artifacts** like Platform that can be kept under version control describe what the system should look like
- A RESTful, batch and online **API** to help automate deployment and management
- The CICS Explorer **UI** for administration integrates the CICS Tools and with source code management
- Monitoring **Data** allows you measure resource consumption
- Creating **Policy** helps you enforce coding standards throughout the application lifecycle and protect production environments

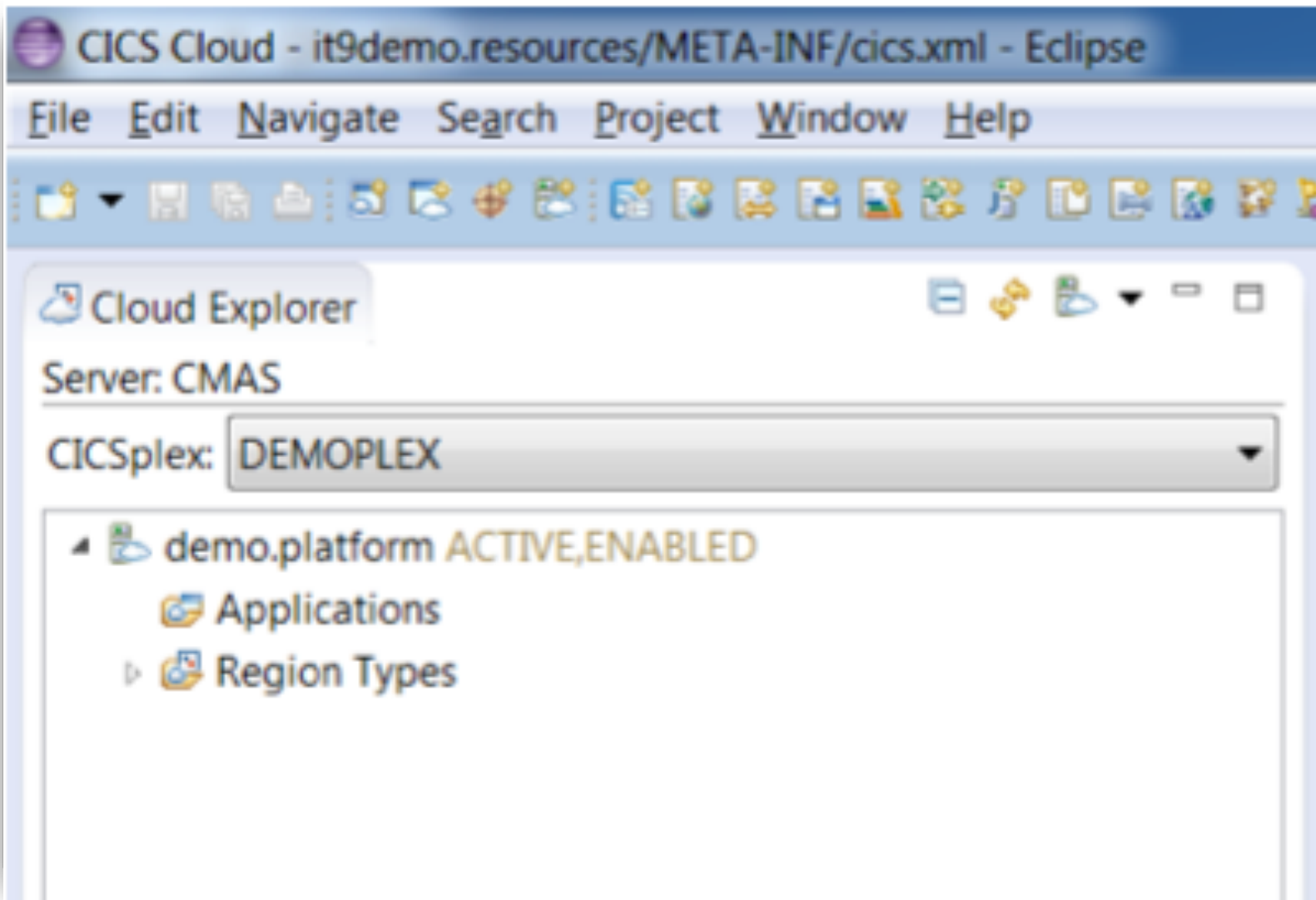
# CICS PLATFORM

# CICS Cloud Resources

- Application:
  - Entry points: PROGRAM, URIMAP
  - Resources: LIBRARY, OSGIBUNDLE, WEBSERVICE, ...
  - Dependencies: JVMSERVER, PIPELINE, ...
- Binding
  - Deployment rules
  - Policy
  - Resources: URIMAP, ...
  - Dependencies: TCPIPService
- **Platform**
  - **Topology**
  - **Policy**
  - **Services: FILE, JVMSERVER, PIPELINE, TCPIPService**



# CICS Explorer: “CICS Cloud” Perspective

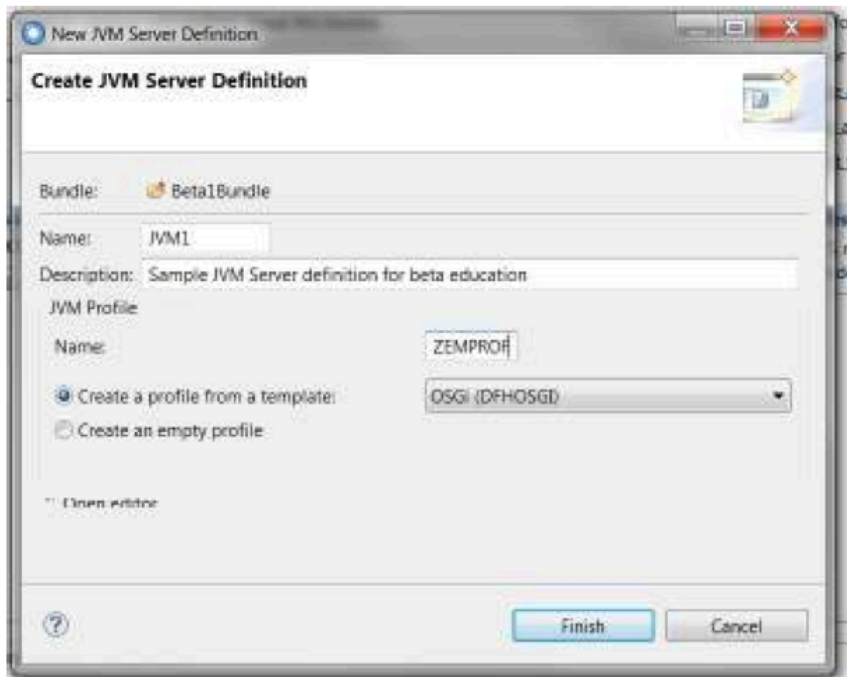


# New in CICS TS V5.2: Platform Resources

- Resources
  - FILE
  - JVMSERVER (including Liberty)
  - TCPIP SERVICE
  - PIPELINE (web services)
- Example driven configuration
  - JVM server profile
  - pipeline configuration
- Configuration life-cycled with parent resource
  - definition, configuration, ...
  - creation, collaboration, deployment

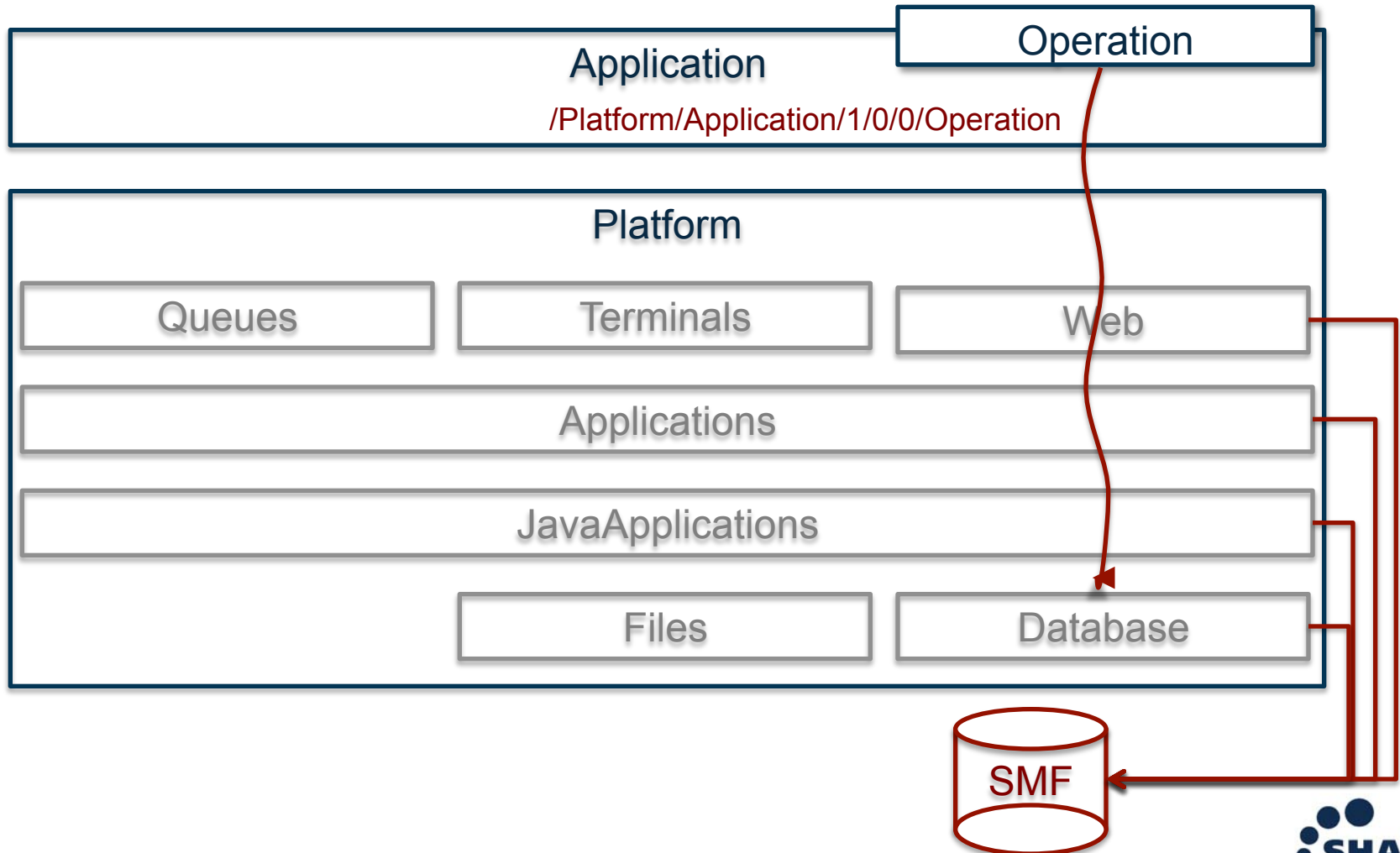
# Create JVM Server Definition in a CICS Bundle

- ▲ Beta1Bundle
  - ▷ META-INF
  - FILEA.file
  - JVM1.jvmserver
  - ZEMPROF.jvmprofile



```
#####
# JVM profile: DFHOSGI
#
# This sample CICS JVM profile is for a JVM server.
#
#####
#
# Symbol Substitution
# -----
#
# The following substitutions are supported:
# &USSHOME; => The value of the USSHOME SIT parameter.
# &CONFIGROOT; => the location of configuration files, such as the
# JVM profile.
# &APPLID; => The applid of the CICS region.
# &JVMSERVER; => The name of the JVMSERVER resource.
# &DATE; => Date the JVMSERVER is enabled. Dyymmdd
# &TIME; => Time the JVMSERVER is enabled. Thhmmss
#
# All variables must be delimited with & and ;
# Using substitutions means that you can use the same profile
# for multiple regions and still have unique working directories
# and output destinations for each region.
#
# With this substitution
# ENV_VAR=myvar.&APPLID;.&JVMSERVER;.data
# becomes
# ENV_VAR=myvar.ABCDEF.JSERVER1.data
# for a JVMSERVER resource with the name JSERVER1 in a CICS region with
# applid ABCDEF.
#
```

# Monitoring



# Dynamic routing by application context

- PROGRAM and URIMAP entry points set application context
- Application context available in addition to TRANID in the following URM's:
  - The CICS Dynamic Routing Exit Commarea (DFHDYPDS)
  - The CPSM User Service Program Commarea (EYURWTRA)
  - The CPSM WLM Router Access Program Commarea (EYURWCOM)

# CICS THRESHOLD POLICY

# Real World Example: Phone Contract

200 free minutes

Unlimited text messages

500MB of data

*“You have now used 80% of your data allowance”*

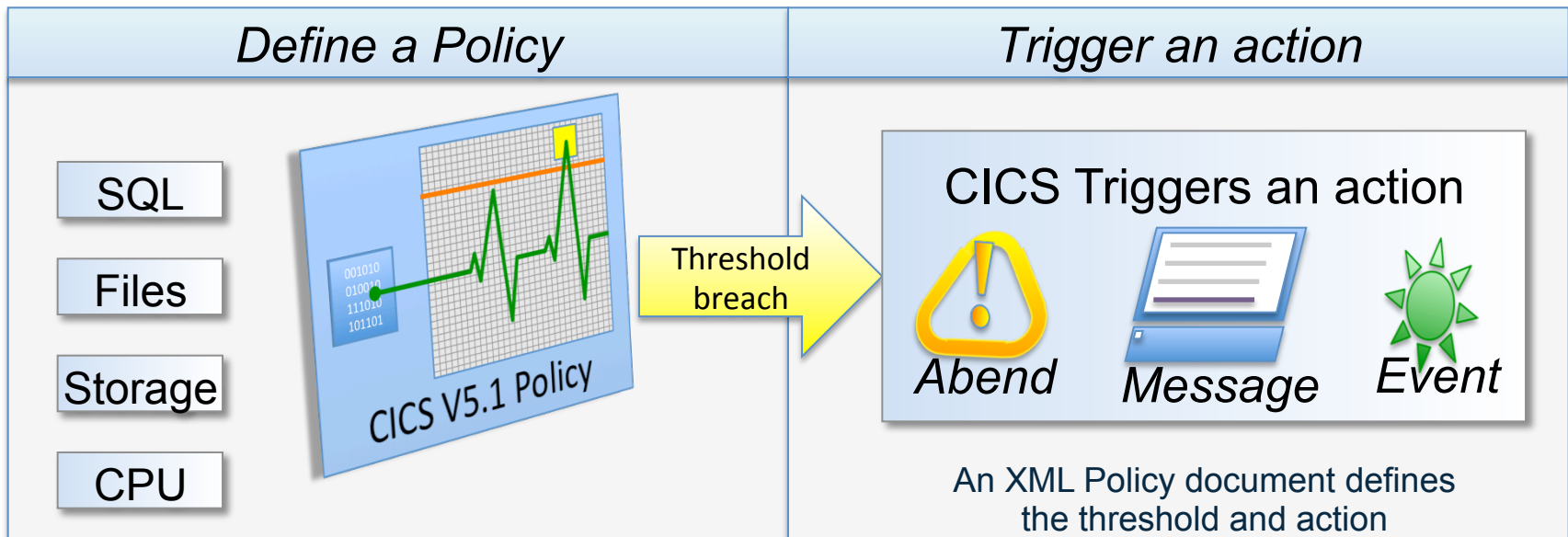
# Rules and Policy

- Rules
  - Resources: minutes, texts, data
  - Threshold: 80%, 100%
  - Action: message, change tariff
- Policy
  - Collection of rules (contract)

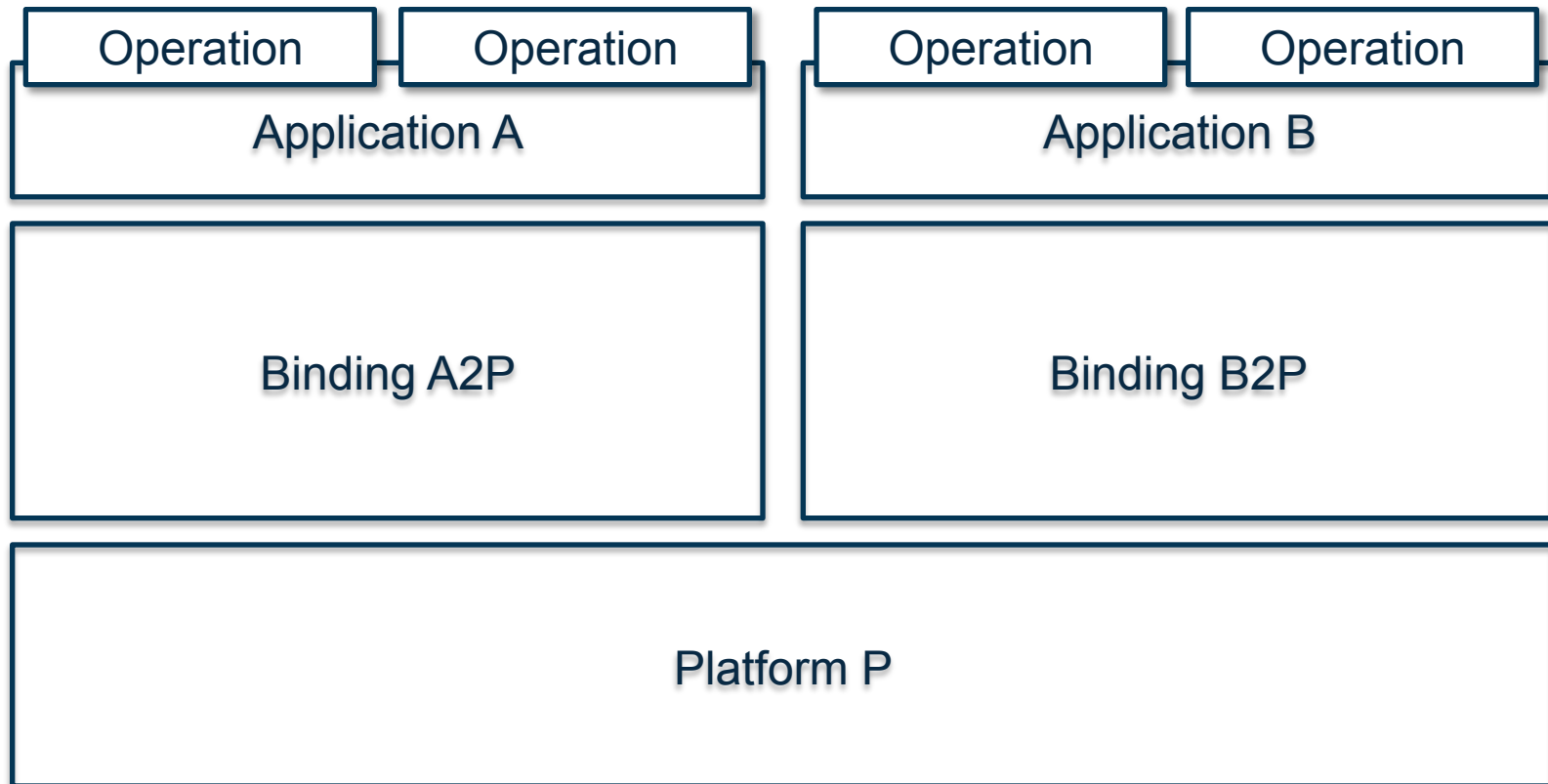


# Threshold Policy

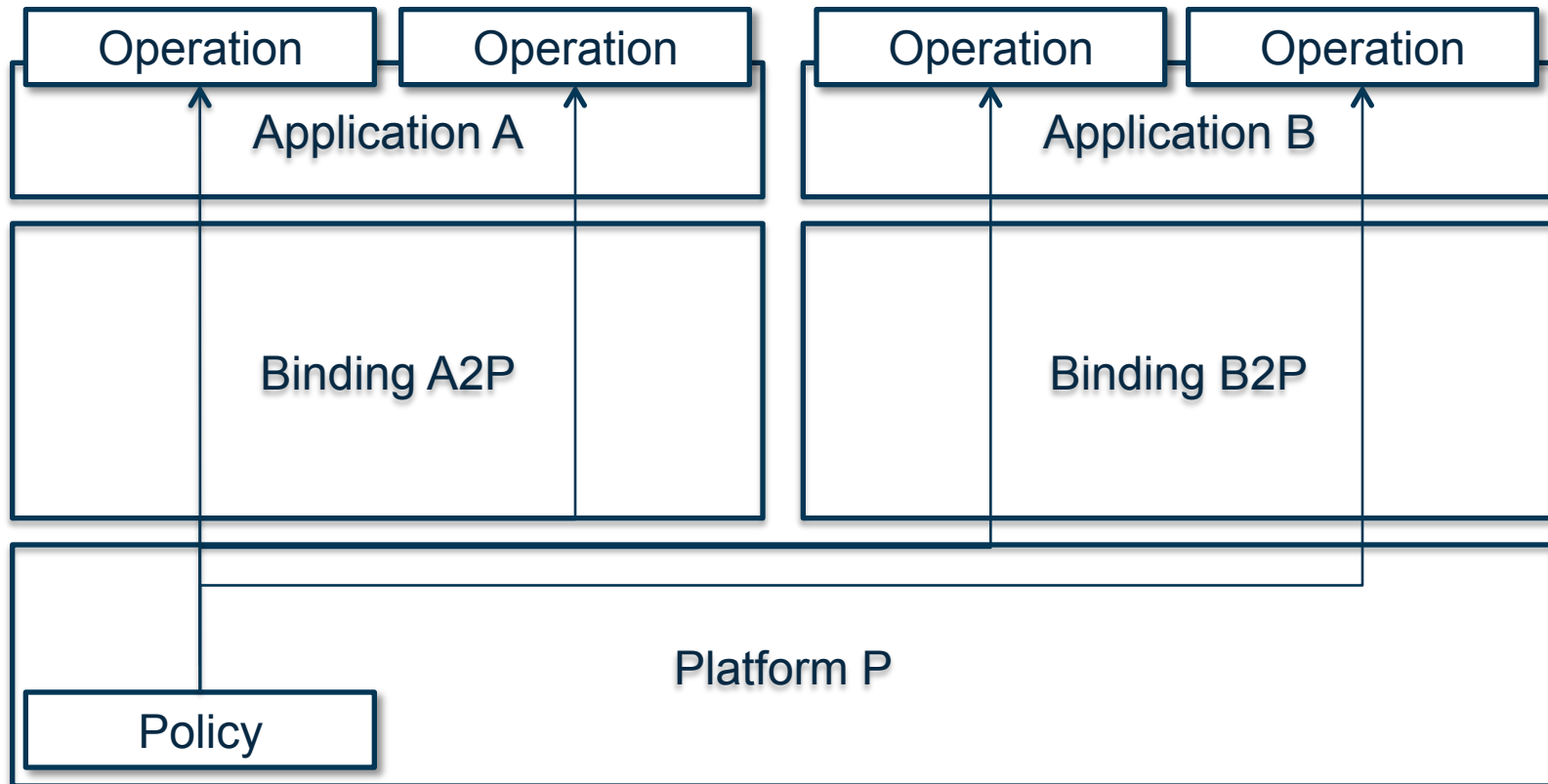
- Policy Based Management
  - Resource, threshold, and action
  - Action can be:
    - Emit a message
    - Emit a system event
    - Abend the task
- Scoped
- New resources in CICS TS V5.2



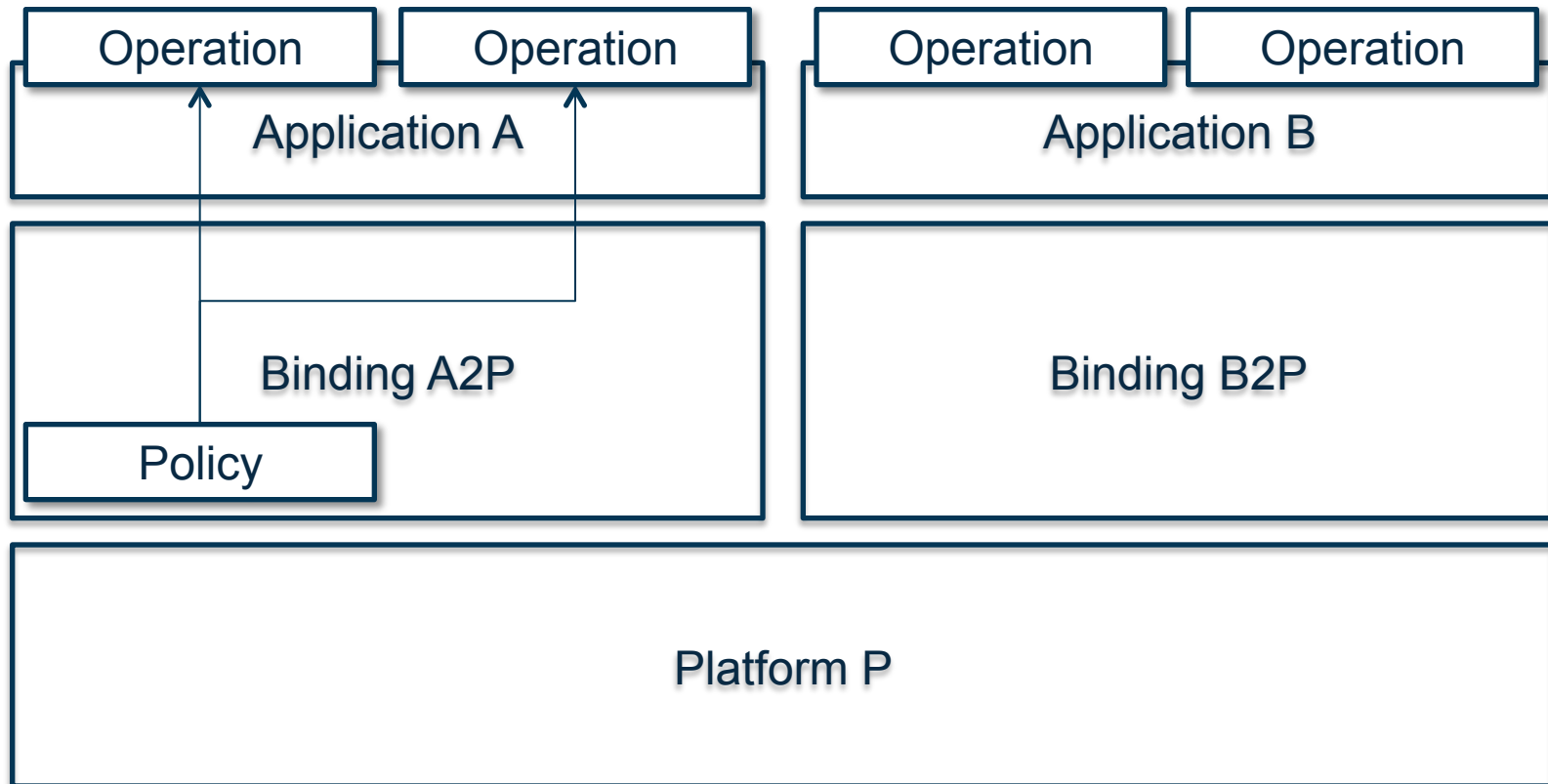
# Policy Scoping



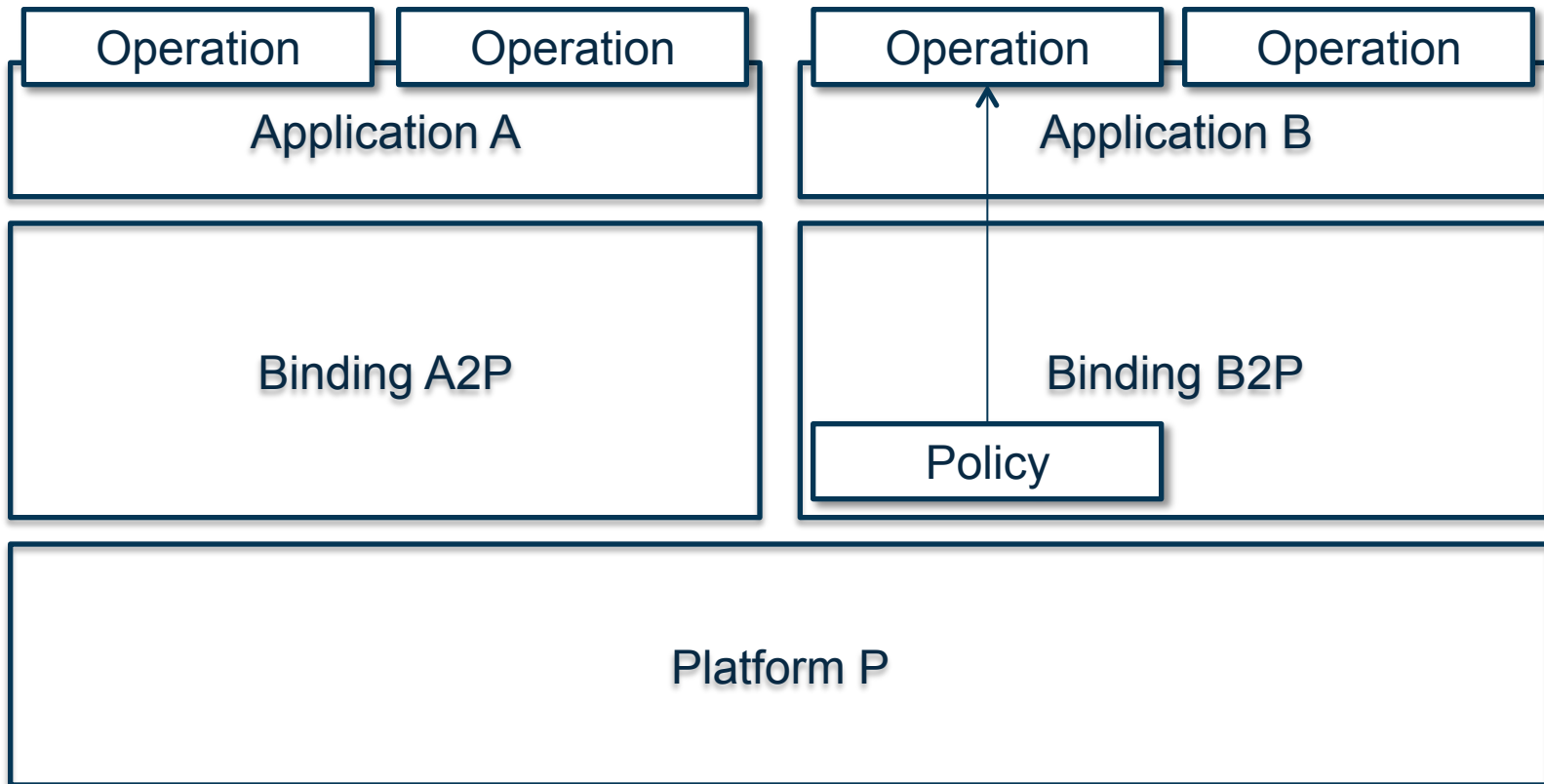
# Policy Scoping: Platform



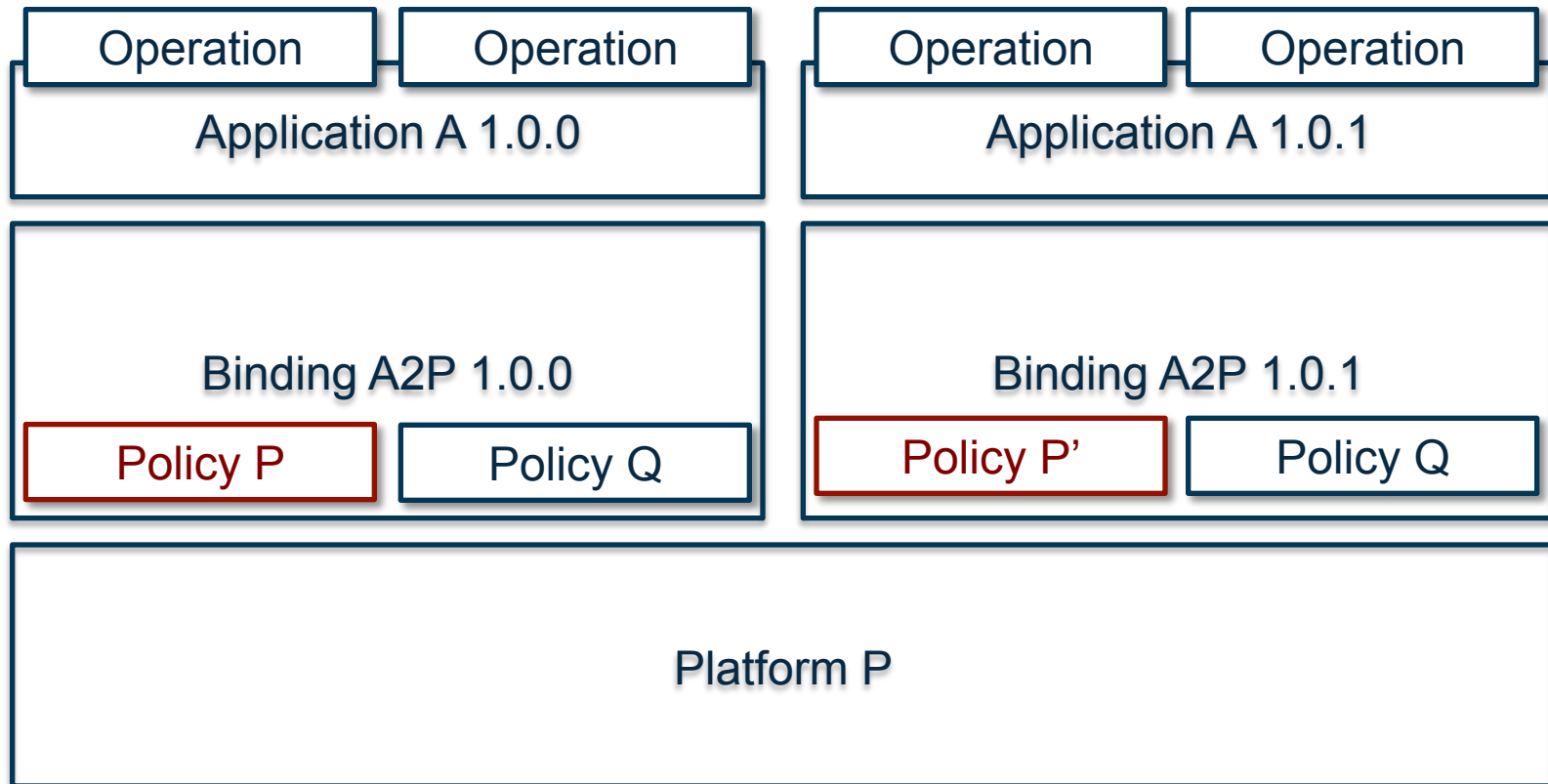
# Policy Scoping: Application



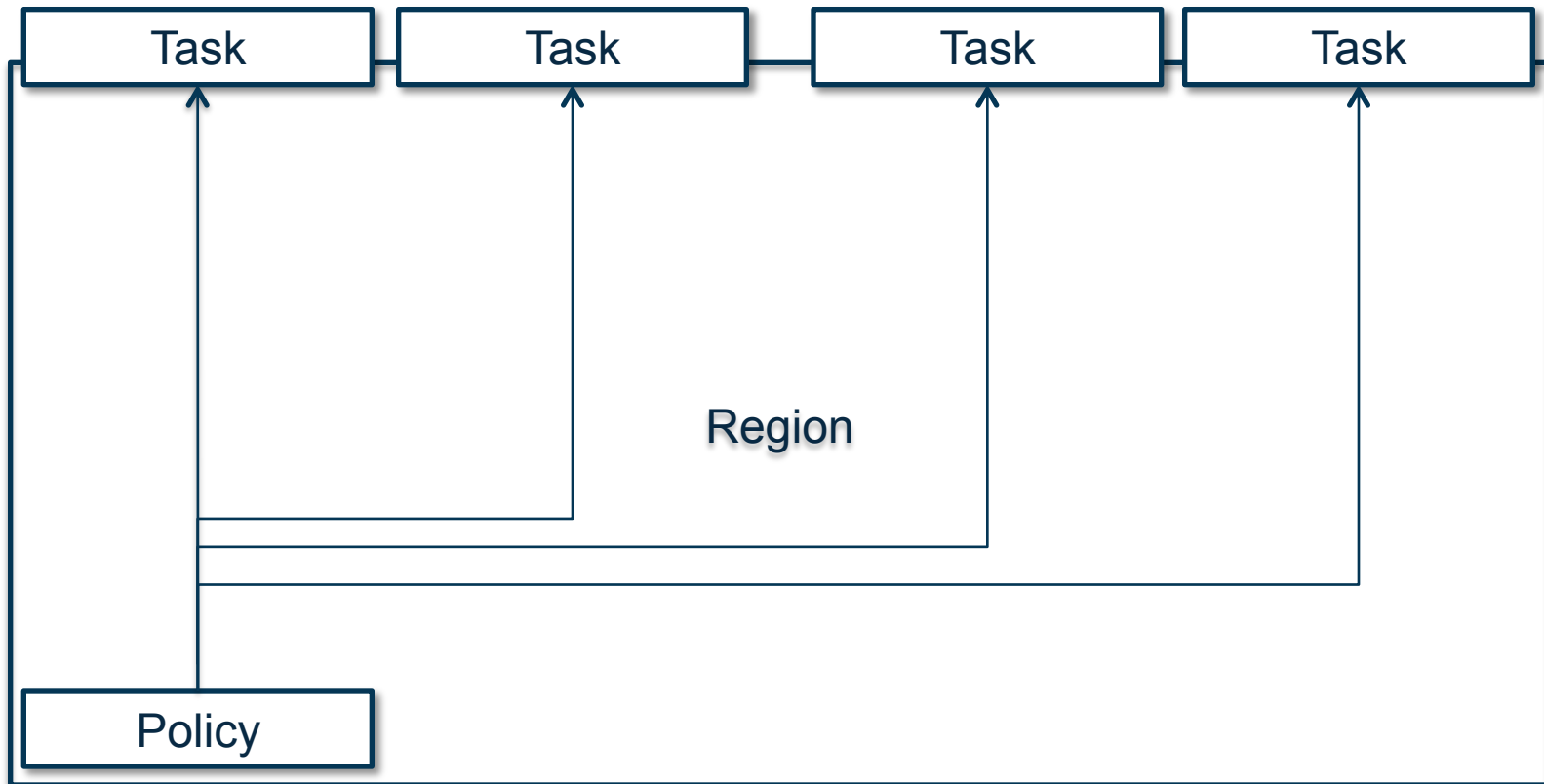
# Policy Scoping: Operation



# Policy Scoping: Application Multi-Versioning



# Policy Scoping: CICS Region



# Threshold Policies

- V5.1
  - CPU time
  - Storage requests & bytes
  - SQL requests
  - LINK requests
  - FILE requests
- V5.2
  - **Elapsed time** (RFE 31868 “Add elapsed time ...”)
  - **TDQ requests & bytes**
  - **TSQ requests & bytes**
  - **START requests**
  - **SYNCPOINT requests**



# TS Queue bytes

- Trigger on amount of data written
- Selection for
  - Main and AUX
- Request is counted whether the request is successful or not
- Both local and remote requests are counted

**Create Policy Definition**

**Add a rule**

✖ Rule Name: contains invalid characters. Valid characters are a-z, A-Z, 0-9, and \_#@-, and must start with a-z, A-Z.

**Policy Information**

Name:\*  (is also the bundle part name)

Description:

**Rule Information**

Name:\*

Description:

What is the condition that triggers the rule?

Type:  (List: TD Queue request, Time, TS Queue bytes, TS Queue request)

Item:  (List: WRITEQ TS command, WRITEQ TS auxiliary command, WRITEQ TS main command)

Operator:  Value:\*  Unit:

What action should be taken when the rule's condition is exceeded?

Issue message DFHMP3001

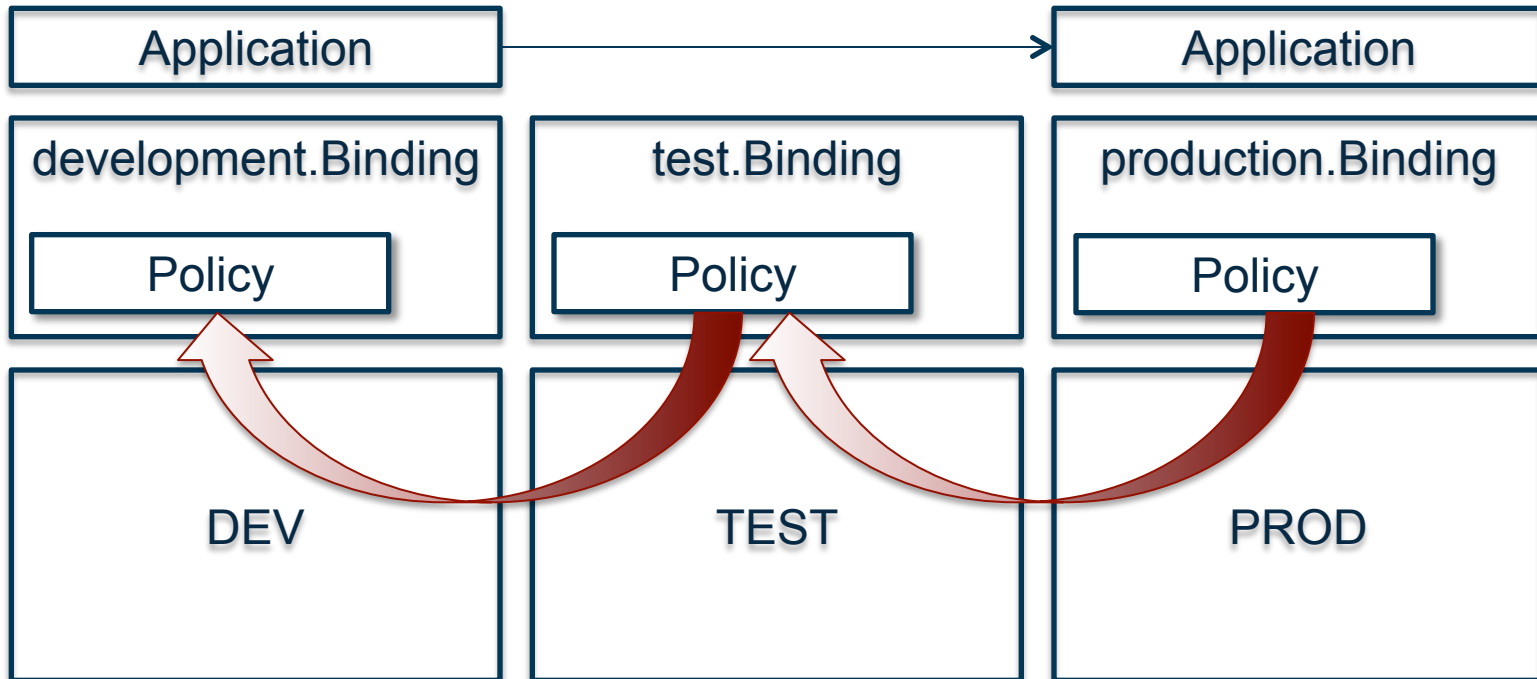
Emit event to

EP Adapter   EP Adapter Set

Abend task with abend code AMPB

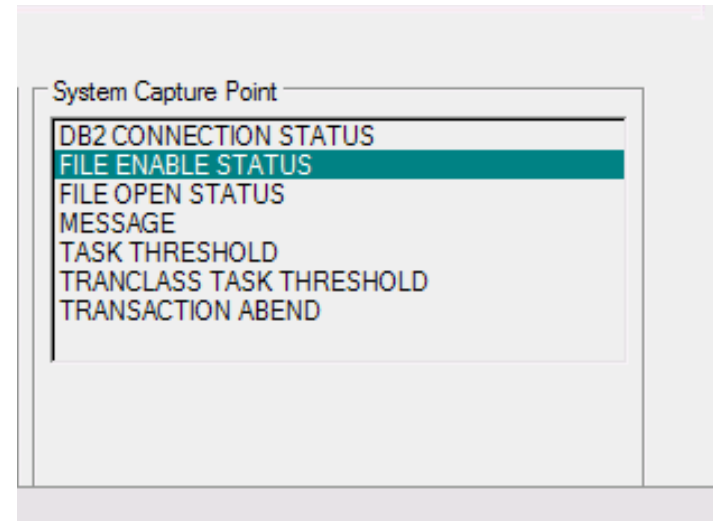
Open Editor

# DevOps: Using Policy Throughout the Application Life-cycle



# System Events

- Capture events when:
  - DB2 connection status changes
  - FILE enable status changes
  - FILE open status changes
  - CICS message is issued
  - Unhandled transaction abends
  - Current active tasks for a TRANCLASS goes above or below a certain percentage of MAXACTIVE
  - Current active task in a region goes above or below a certain percentage of MAXTASKs



# System Event Examples

- Generate an alert whenever a connection from CICS to DB2 is no longer in Connected status
- Emit events for all transaction classes when the number of transactions in the tranclass goes below 50%, to understand which tranclasses are least used (write the events to a TS queue, or monitor by sending to IBM business monitor)
- Collect events about any changes in the open status of the 'CUSTOMER' file, to ensure these happen within the approved batch windows

# Summary

- V4.2
  - System events
- V5.1
  - Application, Platform, Policy
  - 1 Entry Point: PROGRAM
  - 5 Thresholds: CPU time, Storage requests & bytes, ...
- V5.2
  - Platform resources: JVMSERVER, PIPELINE, TCPIP SERVICE,
  - 2 Entry Points: PROGRAM, URIMAP
  - 10 Thresholds: Elapsed time, TDQ requests & bytes, ...
  - Dynamic routing by application context

# CICS PERFORMANCE ANALYZER

# Application Context performance summary

## CICS PA perspective

CICS PA - IBM CICS Explorer - C:\Explorer520

File Edit Navigate Search Project Run Window Help

Quick Access CICS SM CICS PA CICS CM z/OS CICS Cloud SM Administration

Application context summary (56/56 rows)

Application Context Platform: DSWCloud. Application: DSWCloudApplication. Version: 1.0.0. Current layout: \*STAPPL1

Start d...	Start ti...	Platform	Application Name	App...	Application Operation	Task ...	Response time avg	User Dispatch time avg	User CPU time avg	Suspend time a...
2014-0...	16.20.00	DSWCloud	DSWCloudApplicat...	1.0.0	CustomerInquiry	140	0.047168	0.001033	0.000841	0.046135

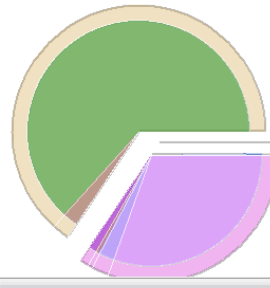
Application context summary (56/56 rows)

Application Context Platform: DSWCloud. Application: DSWCloudApplication. Version: 1.0.0. Current layout: \*STAPPL1

Start d...	Start ti...	Platform	Application Name	App...	Application Operation	Task ...	Response time avg	User Dispatch time avg	User CPU time avg	Suspend time a...
2014-0...	16.20.00	DSWCloud	DSWCloudApplicat...	1.0.0	CustomerInquiry	140	0.047168	0.001033	0.000841	0.046135
2014-0...	16.20.00	DSWCloud	DSWCloudApplicat...	1.0.0	HotelBookingDetails	95	0.065347	0.000953	0.000739	0.064394
2014-0...	16.20.00	DSWCloud	DSWCloudApplicat...	1.0.0	HotelBookingInquiry	97	0.038512	0.000924	0.000724	0.037588
2014-0...	16.20.00	DSWCloud	DSWCloudApplicat...	1.0.0	InprocessInventoryUpdate	137	0.117120	0.002224	0.001715	0.114897
2014-0...	16.20.00	DSWCloud	DSWCloudApplicat...	1.0.0	InquiryonBillofMaterial	187	0.034260	0.001884	0.001590	0.032376
2014-0...	16.20.00	DSWCloud	DSWCloudApplicat...	1.0.0	LabourOperationsInquiry	253	0.033280	0.002724	0.002315	0.030556
2014-0...	16.20.00	DSWCloud	DSWCloudApplicat...	1.0.0	Menu	1,824	0.028670	0.000510	0.000369	0.028161
2014-0...	16.20.00	DSWCloud	DSWCloudApplicat...	1.0.0	MessageTransfertoLog	185	0.029458	0.000670	0.000500	0.028788
2014-0...	16.20.00	DSWCloud	DSWCloudApplicat...	1.0.0	OrderInquiry	163	0.028572	0.000504	0.000407	0.028067
2014-0...	16.20.00	DSWCloud	DSWCloudApplicat...	1.0.0	PartLocationInquiry	188	0.024554	0.001028	0.001450	0.022616

Application Operation

- BillofMaterialInquiry (4)
- CustomerDetailsUpdate (4)
- CustomerInquiry (4)
- HotelBookingDetails (4)
- HotelBookingInquiry (4)



Suspend time component	Time (average)	Count (average)	%Suspend time	%Relative
▲ Suspend time	0.046135	10.992857	-	-
▲ Total I/O wait time	0.030217	0	65.50%	65.50%
■ JC I/O wait time	0.029251	1.107143	63.40%	96.80%
■ File I/O wait time	0.000966	1.721429	2.09%	3.20%
▲ Other wait time	0.015918	0	34.50%	34.50%
■ First dispatch delay time	0.000535	1	1.16%	3.36%
■ Lock delay time	0.000244	0.050000	0.53%	1.53%
■ Change-TCB mode delay time	0.001009	6	2.19%	6.34%
■ VSAM string wait time	0.014057	0	30.47%	88.30%
■ Give up control wait time	0.000074	0.314286	0.16%	0.46%

# Application Context performance summary

## CICS Cloud perspective

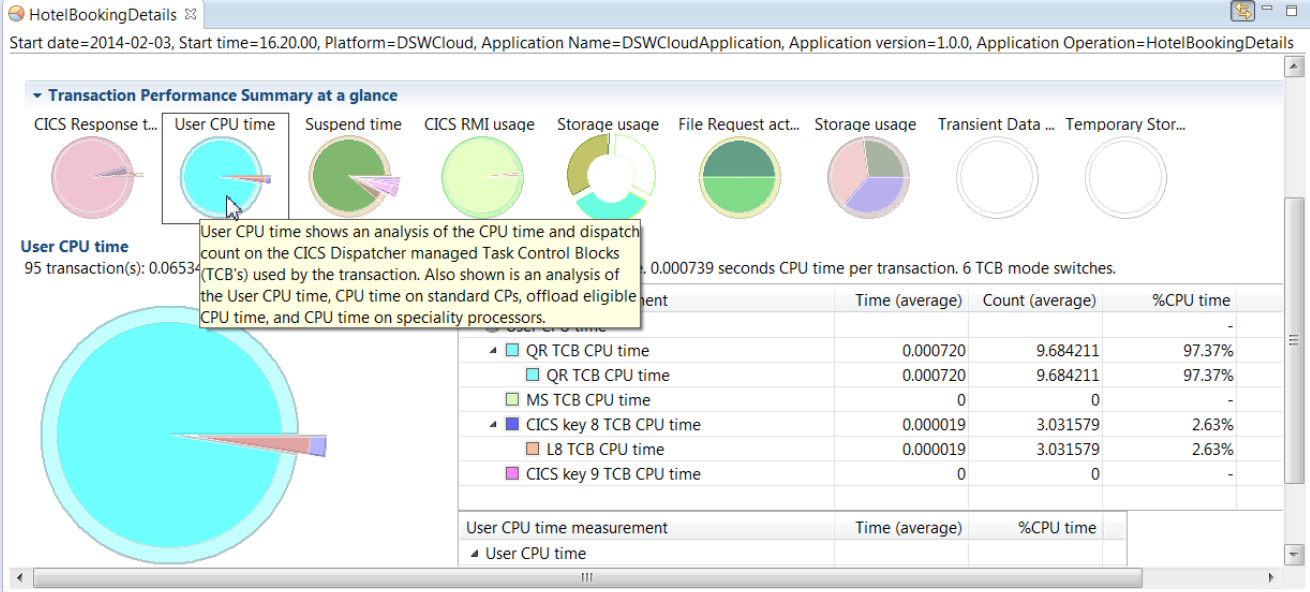
CICS Cloud - IBM CICS Explorer - C:\Explorer520

File Edit Navigate Search Project Window Help

Quick Access CICS SM CICS PA CICS CM z/OS CICS Cloud SM Administration

Cloud Explorer  
Server: CM52  
CICSplex: TOOLPL52

- DSWCloudApplication v1.0.0 ENABLED,UNAVAILAB...
- DSWCloud ACTIVE,EMPTY
- Operations
- Region Types
  - DSWRegions (1/1)
    - Bundles
      - DSWCICSBundle v1.0.0 ENABLED,UNAVAI...



Application context summary (56/56 rows)

Application Context Platform: DSWCloud. Application: DSWCloudApplication. Version: 1.0.0. Current layout: STAPPL1

Start date	Start time	Platform	Application Name	Appli...	Application Operation	Tas...	Response time avg	User Dispatch time avg	User CPU time a...
2014-02-...	16.20.00	DSWCloud	DSWCloudApplication	1.0.0	BillofMaterialInquiry	96	0.462902	0.003124	0.002613
2014-02-...	16.20.00	DSWCloud	DSWCloudApplication	1.0.0	CustomerDetailsUpdate	141	0.113888	0.001370	0.001065
2014-02-...	16.20.00	DSWCloud	DSWCloudApplication	1.0.0	CustomerInquiry	140	0.047168	0.001033	0.000841
2014-02-...	16.20.00	DSWCloud	DSWCloudApplication	1.0.0	HotelBookingDetails	95	0.065347	0.000953	0.000735
2014-02-...	16.20.00	DSWCloud	DSWCloudApplication	1.0.0	HotelBookingInquiry	97	0.038512	0.000924	0.000724
2014-02-...	16.20.00	DSWCloud	DSWCloudApplication	1.0.0	InprocessInventoryUpdate	137	0.117120	0.002224	0.001715
2014-02-...	16.20.00	DSWCloud	DSWCloudApplication	1.0.0	InquiryonBillofMaterial	187	0.034260	0.001884	0.001590
2014-02-...	16.20.00	DSWCloud	DSWCloudApplication	1.0.0	LabourOperationsInquiry	253	0.033280	0.002724	0.002315
2014-02-...	16.20.00	DSWCloud	DSWCloudApplication	1.0.0	Menu	18	0.028670	0.000510	0.000366



# Report forms to help with definition of policy

Delivered in CICS PA 5.1

Name	Type	Description
MPFCRQ	SUMMARY	Platform - File Request Summary
MPMISC	SUMMARY	Platform - CPU/LINKs/DB2 Summary
MPSHRSTG	SUMMARY	Platform - Shared Stg Summary
MPT24STG	SUMMARY	Platform - 24-bit Stg Summary
MPT31STG	SUMMARY	Platform - 31-bit Stg Summary
MPT64STG	SUMMARY	Platform - 64-bit Stg Summary
MPTXCLST	LIST	Platform - Threshold Exceeded
MPTABND	LIST	Platform policy - Transaction Abend

New in CICS PA 5.2

Name	Type	Description
MPMISC1	SUMMARY	Platform - Response/CPU Summary
MPMISC2	SUMMARY	Platform - Misc Requests Summary
MPTDRQ	SUMMARY	Platform - TD Request Summary
MPTSRQ	SUMMARY	Platform - TS Request Summary

# New Summary report tiered format

- ▶ New tiered report summarizes activity based on two level keys
  - Used for Summary report for Platforms and Applications
    - Using new sample form MPAPPSUM

```

1 V5R2M0
CICS Performance Analyzer
Performance Summary
+
OSUMM0002 Printed at 15:05:19 3/18/2014 Data from 16:24:07 2/03/2014 to 16:37:57 2/03/2014
Page 1
Platform Application - Summary

ACPlatNm: DSWCloud
ACApplNm: DSWCloudApplication
ACApplVr: 1.0.0
ACOperNm      #Tasks  Avg      Max      Avg      Avg      Avg      Max      Avg      Avg
Wait          Response Response Dispatch User CPU  Suspend Suspend DispWait FC
          Time      Time      Time      Time      Time      Time      Time      Time      Time
BillofMaterialInquiry 1316   .4004   2.2716   .0028   .0025   .3976   2.2660   .0099   .0123
CustomerDetailsUpdate 2233   .1093   .4219   .0013   .0011   .1080   .4203   .0031   .0025
CustomerInquiry       2233   .0435   .1800   .0010   .0008   .0425   .1787   .0015   .0009
HotelBookingDetails   1342   .0650   .1647   .0009   .0008   .0641   .1638   .0020   .0021
HotelBookingInquiry   1342   .0340   .1559   .0009   .0007   .0331   .1549   .0012   .0011
InprocessInventoryUpdate 2220   .1102   .5251   .0019   .0017   .1082   .5230   .0038   .0059
InquiryonBillofMaterial 3104   .0331   .0966   .0018   .0016   .0313   .0948   .0016   .0016
LabourOperationsInquiry 4024   .0333   .1075   .0025   .0023   .0307   .1018   .0017   .0016
Menu                  28727  .0278   .1217   .0005   .0004   .0273   .1211   .0008   .0000
MessageTransferToLog  2601   .0286   .1121   .0006   .0005   .0280   .1115   .0009   .0000
OrderInquiry          2655   .0279   .0761   .0005   .0004   .0274   .0755   .0009   .0000
PartLocationInquiry   2655   .0329   .2390   .0017   .0015   .0311   .2369   .0015   .0013
PartNumberDelete      4431   .1113   .4668   .0011   .0010   .1102   .4657   .0030   .0026
ReceiveData           7009   .0549   .2366   .0011   .0010   .0538   .2352   .0020   .0020
                   65892   .0515   2.2716   .0010   .0008   .0505   2.2660   .0016   .0012
  
```

# Summary

- V5.1
  - Application, Platform, Policy
  - 1 Entry Point: PROGRAM
  - 5 Thresholds: CPU time, Storage requests & bytes, ...
- V5.2
  - Platform resources: JVMSERVER, PIPELINE, TCPIP SERVICE,
  - 2 Entry Points: PROGRAM, URIMAP
  - 10 Thresholds: Elapsed time, TDQ requests & bytes, ...
  - Dynamic routing by application context

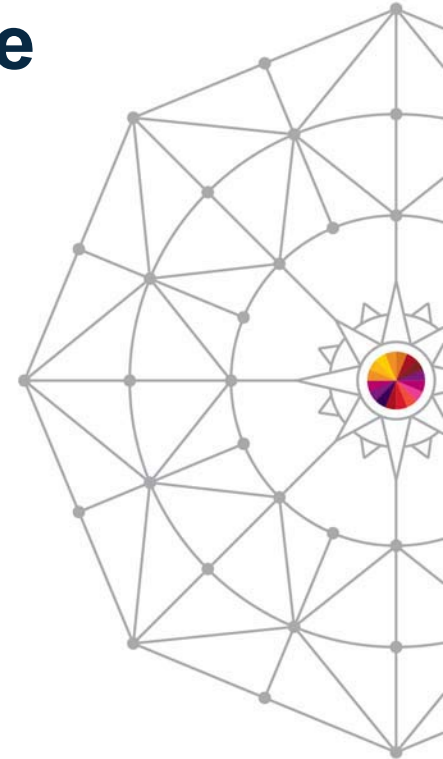
# QUESTIONS?

# More Information

- **Blog**  
<https://www.ibm.com/developerworks/mydeveloperworks/blogs/cicsdev/tags/blog?lang=en>
  - *Meet Abigail and Simon*
  - *What is CICS Application Multi-versioning?*
- **Podcasts**  
<http://www.ibm.com/software/os/systemz/podcasts/websphereonz/>
  - *Coming soon!*
- **Scenarios**  
[https://www-01.ibm.com/support/knowledgecenter/#/SSGMCP\\_5.1.0/com.ibm.cics.ts.scenarios.doc/topics/Scenarios.html](https://www-01.ibm.com/support/knowledgecenter/#/SSGMCP_5.1.0/com.ibm.cics.ts.scenarios.doc/topics/Scenarios.html)
  - *Scenario: Creating and deploying policies*

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