



# Looking at zAAPs and zIIPs with OMEGAMON XE on z/OS

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## Agenda

- Overview of zIIPs and zAAPs
- Currently available zIIP and zAAP data in OMEGAMON XE on z/OS Version 3.1.0
- Additional zIIP and zAAP data available in OMEGAMON XE on z/OS Version 4.1.0 (1<sup>st</sup> Quarter 2007)
- Currently available zIIP and zAAP data in OMEGAMON “Classic”

# Overview of zIIPs and zAAPs

## zAAP (IBM System z Application Assist Processor)

- ▶ Introduced 2004, designed to help improve resource optimization for z/OS® Java technology-based workloads.
- ▶ Initially the zAAP was called the Integrated Facility for Applications (IFA).
- ▶ Requires z/Architecture platform (IBM z890, IBM z990 and follow-on models)
- ▶ Operating system support introduced in z/OS Version 1.6.
- ▶ zAAP-eligible work can be performed on standard CPs (Crossover)
- ▶ OMEGAMON XE on z/OS
  - LPAR-level support available in Version 3.1.0 since its G.A..
  - Sysplex-level support in Version 4.1.0 (1Q2007)
- ▶ Runs at full speed on sub-capacity models (z890, IBM System z9 BC/EC) regardless of standard CP speeds

# Overview of zIIPs and zAAPs

## zIIP (IBM System z9 Integrated Information Processor)

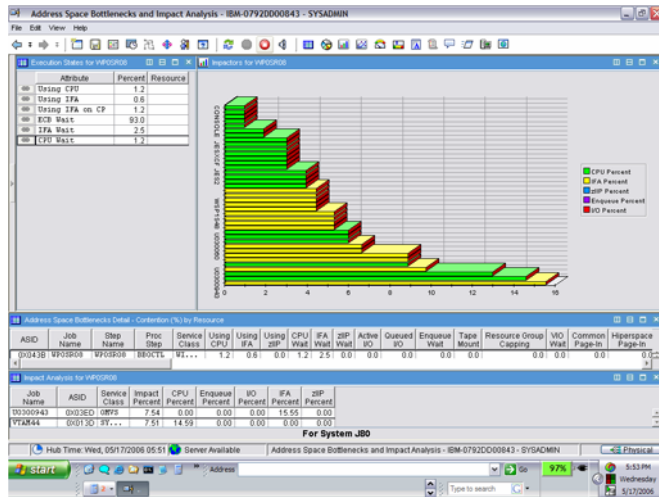
- ▶ Introduced 2006, designed to help improve resource optimization for eligible data workloads within the enterprise.
- ▶ Requires z9 platform (IBM System z9 BC, IBM System z9 EC)
- ▶ Operating system support introduced in z/OS Version 1.8. Available via maintenance in z/OS Versions 1.6 and 1.7.
- ▶ zIIP-eligible work can be performed on standard CPs (Crossover)
- ▶ OMEGAMON XE on z/OS
  - LPAR-level support available now through Version 3.1.0 maintenance (APARs OA15900, OA15899, OA15898 NOTE: latest is OA15900 was PE'd. The fixing apar is OA17494. Also OA15898 has a fix OA17682).
  - Sysplex-level support in Version 4.1.0 (1Q2007)
- ▶ Runs at full speed on sub-capacity models regardless of standard CP speeds

# Prerequisites to Support zIIP DB2 Data

- DB2 z/OS V8 Prerequisite APARs
  - PK18454 for DDF using DRDA over TCP/IP
  - PK19921 for star schema parallel queries
  - PK19920 for index maintenance in DB2 Utilities
  
- OMEGAMON XE for DB2 PE/PM Version 3.1.0 APAR PK25395 / PTF UK15518
  - ▶ zIIP CPU time offloaded on DB2 plan and package level (DB2 class 1,2,7)
  - ▶ zIIP eligible CPU time (DB2 class 1)

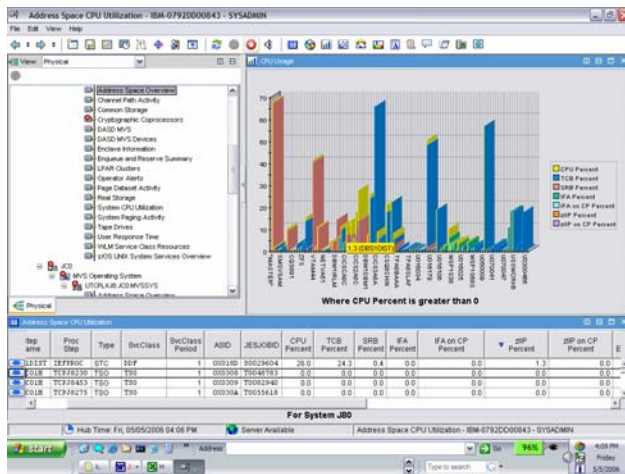
## Overview of zIIPs and zAAPs

- PROJECTCPU=YES|NO
  - ▶ z/OS Version 1.8 (and Versions 1.6 and 1.7 with zIIP maintenance) support a SYS1.PARMLIB(IEAOPTxx) keyword PROJECTCPU.
  - ▶ When PROJECTCPU=YES is specified both zAAP-eligible and zIIP-eligible workloads will populate various zAAP and zIIP z/OS internal zAAP On CP and zIIP On CP accounting fields. This allows OMEGAMON XE on z/OS and other monitoring products to provide customers with projections of how much zAAP and/or zIIP resource would be utilized by current workloads before the actual hardware is installed.



# Currently available zIIP and zAAP data in OMEGAMON XE on z/OS Version 3.1.0

# Currently available zIIP and zAAP data in OMEGAMON XE on z/OS Version 3.1.0



- LPAR-level Workspaces where zAAP and zIIP data is available
  - ▶ Address Space Overview
  - ▶ Address Space CPU Utilization Summary
  - ▶ Address Space CPU Utilization
  - ▶ Address Space Bottlenecks Summary
  - ▶ Address Space Bottlenecks Detail
  - ▶ Address Space Bottlenecks and Impact Analysis
  - ▶ Enclave information
  - ▶ WLM Service Class Resources
  - ▶ System CPU Utilization
  
- All zAAP and zIIP data is available in both real-time and historical workspaces
  
- zIIP data requires APARs OA15900, OA15899 and OA15898 plus workstation Web-deliverable Interim Fix Pack 3.1.0-TIV-KM5-IF0001 or 3.1.0-TIV-KM5-ITM-IF0001



# Currently available zIIP and zAAP data in OMEGAMON XE on z/OS Version 3.1.0

## ■ LPAR-level Workspaces

### ▶ Address Space Processor percent utilization

- Percent IFA and percent IFA on CP consumed by an address space
- Percent zIIP and percent zIIP on CP consumed by an address space
- Percent IFA and percent IFA on CP consumed by independent enclaves owned by an address space
- Percent IFA and percent IFA on CP consumed by dependent enclaves owned by an address space
- Percent zIIP and percent zIIP on CP consumed by independent enclaves owned by an address space
- Percent zIIP and percent zIIP on CP consumed by dependent enclaves owned by an address space

# Address Space Overview



Address Space Overview - IBM-0792DD00843 - SYSADMIN
File Edit View Help

View: Physical

- Global Queue Data for Sysplex
- GRS Ring Systems Data for Sysplex
- Report Classes Data for Sysplex
- Resource Groups Data for Sysplex
- Service Classes Data for Sysplex
- Service Definition Data for Sysplex
- Shared DASD Groups Data For Sysplex
- XCF Groups Data for Sysplex
- XCF Paths Data for Sysplex
- XCF Systems Data for Sysplex
- z/OS Management Console
- J80
- DB2

### CPU Usage

Page: 2 of 5

Where usage greater than 0%

### Selected Execution States

Page: 1 of 5

Greater than 5%

### Address Space Counts

Address Space Count	Started Task Count	Batch Job Count	TSO Count
420	255	134	

### Central Storage Frame Count

Page: 1 of 7

Where frame counts are greater than 0

### Fixed Storage

Page: 1 of 7

### Address Space CPU Utilization Summary

Page: 2 of 5

IFA Percent	IFA on CP Percent	zIIP Percent	zIIP on CP Percent
1.3	0.0	0.0	0.0
1.3	0.0	0.0	0.0
1.3	0.0	0.0	0.0
0.8	0.0	0.0	0.0

Hub Time: Wed, 08/09/2006 07:04 PM    Server Available    Address Space Overview - IBM-0792DD00843 - SYSADMIN

# Address Space CPU Usage



Address Space CPU Usage Class and Period - IBM-0792DD00843 - SYSADMIN

File Edit View Help

View: Physical

- Address Space Overview
- Channel Path Activity
- Common Storage
- Cryptographic Coprocessors
- DASD MVS
- DASD MVS Devices
- Enclave Information
- Enqueue and Reserve Summ
- LPAR Clusters
- Operator Alerts
- Page Dataset Activity
- Real Storage
- System CPU Utilization

Refresh Now (F5)

Where CPU Percent is greater than 0

SRB Percent	IFA Percent	IFA on CP Percent	zIIP Percent	zIIP on CP Percent	Independent Enclave IFA%	Independent Enclave IFA% On CP	Independent Enclave zIIP%	Independent Enclave zIIP% On CP	Dependent Enclave CPU%	Dependent Enclave IFA%	Dependent Enclave IFA% On CP	Dependent Enclave zIIP%	Dependent Enclave zIIP% On CP
0.4	0.0	0.0	1.7	0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0
2.1	0.0	0.0	1.3	0.0	0.0	0.0	4.3	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

For System J80 Service Class DDF Period 1

Hub Time: Fri, 05/05/2006 04:15 PM Server Available Address Space CPU Usage Class and Period - IBM-0792DD00843 - SYSADMIN

# Currently available zIIP and zAAP data in OMEGAMON XE on z/OS Version 3.1.0

## ■ LPAR-level Workspaces

### ▶ Address Space Execution and Delay states

- Using IFA      Percentage of all sampled execution/delay states where an address space and/or its owned enclaves are using IFA resource.
- Using zIIP      Percentage of all sampled execution/delay states where an address space and/or its owned enclaves are using zIIP resource.
- IFA Wait      Percentage of all sampled execution/delay states where an address space and/or its owned enclaves are delayed waiting for IFA resource.
- zIIP Wait      Percentage of all sampled execution/delay states where an address space and/or its owned enclaves are delayed waiting for zIIP resource.

# Address Space Bottlenecks Summary



Address Space Bottlenecks Summary - IBM-0792DD00843 - SYSADMIN

File Edit View Help

View: Physical Query Editor... (Ctrl+Q) on States

- Resource Groups Data for Sysplex
- Service Classes Data for Sysplex
- Service Definition Data for Sysplex
- Shared DASD Groups Data For Sysplex
- XCF Groups Data for Sysplex
- XCF Paths Data for Sysplex
- XCF Systems Data for Sysplex
- z/OS Management Console
- J80
  - DB2
  - MVS Operating System
    - Address Space Overview
    - Channel Path Activity

Where Percent is greater than 5

ASID	Job Name	Step Name	Proc Step	Service Class	Using CPU	Using IFA	Using zIIP	CPU Wait	IFA Wait	zIIP Wait	Active I/O	Queued I/O	Enqueue Wait	Tape Mount	Resource Group Capping	Paging Wait	Sen Ws
0X0343	WSP1S38	WSP1S38	BBOCTL	WASCR	0.5	2.2	0.0	0.5	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	(
0X02BF	CICSCA8C	CICSCA8C	CIC364	CICSRGN	4.0	1.7	0.0	0.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	(
0X01CB	WSP1A8	WSP1A8	BBOCTL	WASCR	0.0	1.7	0.0	0.0	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	(
0X01E4	WSP1S48	WSP1S48	BBOCTL	WASCR	0.0	1.1	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	(
0X033A	WSP1M	WSP1M	BBOCTL	WASCR	0.5	1.1	0.0	1.1	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	(
0X01DC	WSP1S68	WSP1S68	BBOCTL	WASCR	0.0	1.1	0.0	0.5	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	(
0X01CA	WSP1S18	WSP1S18	BBOCTL	WASCR	0.0	1.1	0.0	0.5	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	(
0X01B1	CSQ8BRK	RETAILWG	*OMVSEX	VEL30	5.2	0.5	0.0	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	(
0X032E	WSP1S98S	WSP1S98S	BBOSR	WASCR	2.9	0.5	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	(
0X02A3	WP1SR34S	WP1SR34S	BBOSR	WASCR	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	(
0X0252	TPA8NOAI	EXCNO	IFP	WLMBTCHH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	(
0X0251	TPA8SLAI	EXCSL	IFP	WLMBTCHH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	(
0X0250	TPA8SAT	EXCPA0	C	WLMBTCHH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	(

**For System J80**

Hub Time: Wed, 08/09/2006 09:56 PM Server Available Address Space Bottlenecks Summary - IBM-0792DD00843 - SYSADMIN

# Currently available zIIP and zAAP data in OMEGAMON XE on z/OS Version 3.1.0

- LPAR-level Workspaces
  - ▶ Address Space Impact Analysis
    - Percentage impact of address spaces and their owned enclaves using zAAP on a “loved one” address space and/or its owned enclaves experiencing zAAP resource delays.
    - Percentage impact of address spaces and their owned enclaves using zIIP on a “loved one” address space and/or its owned enclaves experiencing zIIP resource delays.

# Address Space Bottlenecks and Impact Analysis



Address Space Bottlenecks and Impact Analysis - IBM-0792DD00843 - SYSADMIN

File Edit View Help

View: Physical

Execution States for MQQPS2CS

Attribute	Percent	Resource
Using CPU	2.0	
Using IFA	1.9	
ECB Wait	88.6	
CPU Wait	3.4	
IFA Wait	2.9	

Impactors for MQQPS2CS

Address Space Bottlenecks Detail - Contention (%) by Resource

ASID	Job Name	Step Name	Proc Step	Service Class	Using CPU	Using IFA	Using zIIP	CPU Wait	IFA Wait	zIIP Wait	Active I/O	Queued I/O	Enqueue Wait	Tape Mount	Resource Group Capping	VIO Wait	Common Page-In	Hipers Page
0X023D	MQQPS2CS	MQQPS2CS	BBOSR	SYSSTC	2.9	1.9	0.0	3.4	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Impact Analysis for MQQPS2CS

Job Name	ASID	Service Class	Impact Percent	CPU Percent	Enqueue Percent	I/O Percent	IFA Percent	zIIP Percent
MQQPS2CS	0X023D	SYSSTC	25.90	29.16	0.00	0.00	21.43	0.00
MQQPS2C	0X023C	SYSSTC	11.54	0.00	0.00	0.00	27.37	0.00
WP1SR22S	0X0332	WASCR	11.54	0.00	0.00	0.00	27.37	0.00
MQQPMS	0X023E	SYSSTC	10.04	0.00	0.00	0.00	23.80	0.00
*MASTER*	0X0001	SYSTEM	2.40	4.16	0.00	0.00	0.00	0.00
BPXA5	0X03DA	OMVSKERN	2.40	4.16	0.00	0.00	0.00	0.00
OMVS	0X0010	SYSTEM	2.40	4.16	0.00	0.00	0.00	0.00
U0300156	0X0392	OMVS	2.40	4.16	0.00	0.00	0.00	0.00
U0300594	0X031F	OMVS	2.40	4.16	0.00	0.00	0.00	0.00

For System JCO

Hub Time: Fri, 05/26/2006 10:13 AM Server Available Address Space Bottlenecks and Impact Analysis - IBM-0792DD00843 - SYSADMIN

# Currently available zIIP and zAAP data in OMEGAMON XE on z/OS Version 3.1.0

- LPAR-level Workspaces

- ▶ Enclaves

- IFA percent utilization by individual enclaves
- IFA on CP percent utilization by individual enclaves
- zIIP percent utilization by individual enclaves
- zIIP on CP percent utilization by individual enclaves
- IFA time consumed by individual enclaves
- IFA on CP time consumed by individual enclaves
- zIIP time consumed by individual enclaves
- zIIP on CP time consumed by individual enclaves



# Enclave Information



Enclaves in Selected Service Class and Period - IBM-0792DD00843 - SYSADMIN

File Edit View Help

View: Physical

Enclave CPU% by Address Space

Legend:

- Independent Enclave CPU%
- Independent Enclave IFA%
- Independent Enclave IFA% On CP
- Independent Enclave zIIP%
- Independent Enclave zIIP% On CP
- Dependent Enclave CPU%
- Dependent Enclave IFA%
- Dependent Enclave IFA% On CP
- Dependent Enclave zIIP%
- Dependent Enclave zIIP% On CP

ALL Address Spaces where Enclave CPU% is greater than zero

	SvcClass	SvcClass Period	RptClass	ResGroup	Workload	CPU Percent	IFA Percent	IFA on CP Percent	zIIP Percent	zIIP on CP Percent	Total CPU	Total IFA	Total IFA on CP	Total zIIP	Total zIIP on CP
0000000000000000...	DDF	1	DDF	STC	STC	66.0	0.0	0.0	36.5	0.0	26.24	0.00	0.00	14.38	0.05
0000000000000000...	DDF	1	DDF	STC	STC	44.3	0.0	0.0	24.3	0.0	1.94	0.00	0.00	1.02	0.04
0000000000000000...	DDF	1	DDF	STC	STC	16.9	0.0	0.0	9.1	0.0	10.43	0.00	0.00	5.67	0.07
0000000000000000...	DDF	1	DDF	STC	STC	15.6	0.0	0.0	8.6	0.0	1.23	0.00	0.00	0.66	0.04
0000000000000000...	DDF	1	DDF	STC	STC	13.4	0.0	0.0	7.3	0.0	1.17	0.00	0.00	0.60	0.05
0000000000000000...	DDF	1	DDF	STC	STC	0.8	0.0	0.0	0.8	0.0	0.02	0.00	0.00	0.02	0.00
0000000000000000...	DDF	1	DDF	STC	STC	1.7	0.0	0.0	0.8	0.0	0.06	0.00	0.00	0.03	0.00
0000000000000000...	DDF	1	DDF	STC	STC	0.8	0.0	0.0	0.4	0.0	0.06	0.00	0.00	0.03	0.01
0000000000000000...	DDF	1	DDF	STC	STC	0.8	0.0	0.0	0.0	0.0	1.04	0.00	0.00	0.54	0.03
0000000000000000...	DDF	1	DDF	STC	STC	0.0	0.0	0.0	0.0	0.0	0.03	0.00	0.00	0.02	0.00
0000000000000000...	DDF	1	DDF	STC	STC	0.0	0.0	0.0	0.0	0.0	0.01	0.00	0.00	0.00	0.00
0000000000000000...	DDF	1	DDF	STC	STC	0.0	0.0	0.0	0.0	0.0	0.05	0.00	0.00	0.03	0.01
0000000000000000...	DDF	1	DDF	STC	STC	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00

For Service Class DDF Period 1 System J80

Hub Time: Tue, 05/09/2006 10:19 PM Server Available Enclaves in Selected Service Class and Period - IBM-0792DD00843 - SYSADMIN

# Currently available zIIP and zAAP data in OMEGAMON XE on z/OS Version 3.1.0

- LPAR-level Workspaces

- ▶ Service Classes

- IFA percent utilization by a service class period
- IFA on CP percent utilization by a service class period
- zIIP percent utilization by a service class period
- zIIP on CP percent utilization by a service class period
- IFA service units consumed by a service class period
- IFA on CP service units consumed by a service class period
- zIIP service units consumed by a service class period
- zIIP on CP service units consumed by a service class period

# WLM Service Class Resources



WLM Service Class Resources - IBM-0792DD00843 - SYSADMIN

File Edit View Help

CPU Percentage

I/Os Per Second

Average Storage Use in Bytes

Where CPU percentage is greater than 0

Where I/O rate is greater than 0

Where storage use is greater than 0

Legend for CPU Percentage:

- Percent CPU
- Percent IFA
- Percent IFA on CP
- Percent zIIP
- Percent zIIP on CP

Legend for Average Storage Use:

- Average Storage

WLM Service Class Resources

Service Class	Period	Goal Type	Goal Percentile	Goal Importance	Goal Value	Duration	Average Response Time	Performance Index	Actual Host	Percent CPU	Percent IFA	Percent IFA on CP	Percent zIIP	Percent zIIP on CP
DDF	1	Velocio	0	Lowest	5	0	221	0.07	87	11.1	0.0	0.0	14.6	0.1
CICSRGN	1	Velocio	0	High	60	0	0	0.69	86	44.1	1.1	0.0	0.2	0.0
SYSTEM	1	SysGoal	0	n/a	0	0	0	0.00	0	45.6	0.0	0.0	0.0	0.0
SYSSTC5	1	SysGoal	0	n/a	0	0	0	0.00	0	0.0	0.0	0.0	0.0	0.0
SYSSTC4	1	SysGoal	0	n/a	0	0	0	0.00	0	0.0	0.0	0.0	0.0	0.0
SYSSTC3	1	SysGoal	0	n/a	0	0	0	0.00	0	0.0	0.0	0.0	0.0	0.0

For System J80

Hub Time: Thu, 08/10/2006 09:32 AM Server Available WLM Service Class Resources - IBM-0792DD00843 - SYSADMIN Physical

# WLM Service Class Resources



WLM Service Class Resources - IBM-0792DD00843 - SYSADMIN

File Edit View Help

### CPU Percentage

Where CPU percentage is greater than 0

### I/Os Per Second

Where I/O rate is greater than 0

### Average Storage Use in Bytes

Where storage use is greater than 0

### WLM Service Class Resources

Service Class	Period	Goal Type	Goal Percentile	Goal Importance	Goal Value	Duration	Average Response Time	Performance Index	Actual Host	Percent CPU	Percent IFA	Percent IFA on CP	Percent zIIP	Percent zIIP on CP
WAS80%01	1	PctResp	80	Highest	1000	0	64	0.50	500	70.9	131.8	53.5	0.0	0.0
WASCR	1	Velocio	0	High	50	0	3182070	1.92	26	31.3	19.6	16.1	0.0	0.0
CICSRGN	1	Velocio	0	High	60	0	0	0.69	86	44.1	1.1	0.1	0.2	0.0
SYSSTC4	1	SysGoal	0	n/a	0	0	0	0.00	0	0.0	0.0	0.0	0.0	0.0
SYSSTC3	1	SysGoal	0	n/a	0	0	0	0.00	0	0.0	0.0	0.0	0.0	0.0
SYSSTC2	1	SysGoal	0	n/a	0	0	0	0.00	0	0.0	0.0	0.0	0.0	0.0

**For System J80**

Hub Time: Thu, 08/10/2006 09:37 AM    Server Available    WLM Service Class Resources - IBM-0792DD00843 - SYSADMIN    Physical

# Currently available zIIP and zAAP data in OMEGAMON XE on z/OS Version 3.1.0

- LPAR-level Workspaces

- ▶ System

- Average IFA percent utilization per IFA processor
- Average IFA on CP percent utilization per standard CP
- Average zIIP percent utilization per zIIP processor
- Average zIIP on CP percent utilization per standard CP
- Number of online IFAs and number of online zIIPs
- Number of offline IFAs and number of offline zIIPs
- Relative processing speed of an IFA processor to a standard CP.
- Relative processing speed of a zIIP processor to a standard CP.
- IFA Crossover setting (IFACrossover=YES|NO)
- IFA Honor Dispatch Priority Setting (IFAHonorpriority=YES|NO)

# System CPU Utilization



System CPU Utilization - IBM-0792DD00843 - SYSADMIN

File Edit View Help

View: Physical

System CPU Utilization

- System CPU Utilization
- System Paging Activity
- Tape Drives
- User Response Time
- WLM Service Class Resource

J90  
JA0  
JB0  
JC0  
JE0  
JF0  
JH0  
DB2plex

Physical

System CPU Utilization

Workload CPU Usage

Partition CPU

Average CPU Percent	RMF MVS CPU Percent	RMF LPAR CPU Percent	Total TCB%	Total SRB%	Average IFA Percent	Average IFA on CP Percent	Average zIIP Percent	Average zIIP on CP Percent	MVS Overhead	4 Hour MSUs	Undispatched Tasks	Partition LCPD%	Partition PCPD%	Partition Overhead%
18	14.8	14.7	327	84	57	0	1	0	88	N/A	0	29	13	0.08 00,0

For System J80

Hub Time: Wed, 08/09/2006 03:58 PM Server Available System CPU Utilization - IBM-0792DD00843 - SYSADMIN

System CPU Utilization - IBM-0792DD00843 - SYSADMIN

File Edit View Help

View: Physical

System CPU Utilization

- System CPU Utilization
- System Paging Activity
- Tape Drives
- User Response Time
- WLM Service Class Resources

J90, JA0, JB0, JC0, JE0, JF0, JH0, DB2plex

Physical

Workload CPU Usage

Partition CPU

System CPU Utilization

CPUs Online	IFAs Online	IFAs Offline	IFA CrossOver	IFA Relative Processor Speed	IFA HonorPriority	zIIPs Online	zIIPs Offline	zIIP Relative Processor Speed	zIIP HonorPriority
04,05,06,07,08,09,0A,0B,0C,0D,0E,0F,10,11,12,13,14,15,16,17,18,19,1A	1B,1C			1.00:1	Yes	1D,1E		1.00:1	Yes

For System J80

Hub Time: Wed, 08/09/2006 04:03 PM Server Available System CPU Utilization - IBM-0792DD00843 - SYSADMIN

LPAR Clusters - IBM-0792DD00843 - SYSADMIN

File Edit View Help

View: Physical

- UTCPLEXJ8.J80.MVSSYS
  - Address Space Overview
  - Channel Path Activity
  - Common Storage
  - Cryptographic Coprocessors
  - DASD MVS
  - DASD MVS Devices
  - Enclave Information
  - Enqueue and Reserve Summ
  - LPAR Clusters
  - Operator Alerts
  - Page Dataset Activity

LPAR Logical Utilization (e.g. Velocity)

Actual (Effective) vs. Target (Logical)

LPAR Physical Utilization

Actual (%CPU) vs. Target (%Weight)

CPC Status

CPC Model#	CPC Serial#	CPs %CPU	CPs %Overhead	CPs Weight	Physical CPs	Special CPs	CPs MSUs
2094-S38	0C299E	31.5	2.3	420	29	9	524

LPAR Clusters

Cluster Name	Physical %CPU	Overhead %CPU	Current Weight	Physical %Weight	Cluster LPARs
ZPETPLX2.299E.2094	8.5	0.2	200	47.6	2
UTCPLEXJ8.299E.2094	22.9	0.6	200	47.6	2

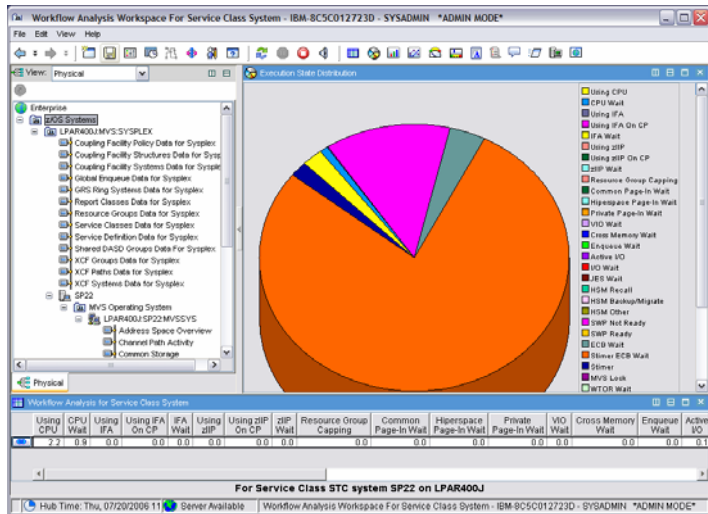
CPC LPARs Status

Cluster Name	LPAR Name	Physical %CPU	Overhead %CPU	Current Weight	Physical %Weight	CPU Index	Effective %Weight	Logical %Weight	Effective Weight Index	Logical %CPU	CPU %Ready	WLM Managed	Initial Weight	Maxim Weig
UTCPLEXJ8.299E.2094	J80	16.8	0.3	100	23.8	0.7	97.8	25.6	3.8	18.1	0.4	YES	100	
UTCPLEXJ8.299E.2094	JF0	6.1	0.3	100	23.8	0.3	95.5	43.1	2.2	11.1	0.5	YES	100	
ZPETPLX2.299E.2094	Z1	6.9	0.1	100	23.8	0.3	97.6	86.3	1.1	24.9	0.6	YES	100	
ZPETPLX2.299E.2094	Z3	1.6	0.1	100	23.8	0.1	97.3	86.3	1.1	5.8	0.2	YES	100	
N/A	DISTR01	0.1	0.0	10	2.4	0.0	81.2	34.8	2.3	0.8	0.2	NO	10	

**As seen from System: J80**

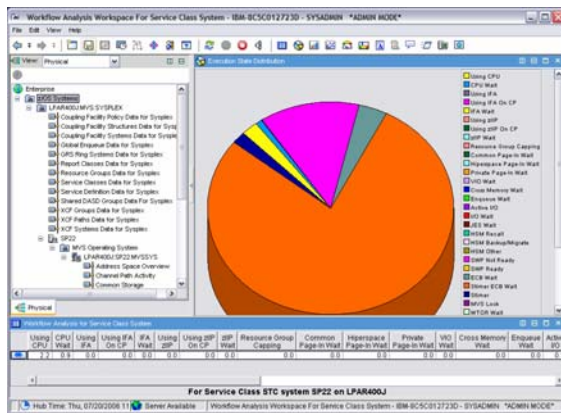
Hub Time: Wed, 08/09/2006 04:06 PM    Server Available    LPAR Clusters - IBM-0792DD00843 - SYSADMIN





Additional  
zIIP and zAAP data  
available in  
OMEGAMON XE on z/OS  
Version 4.1.0  
(1<sup>st</sup> Quarter 2007)

# Additional zIIP and zAAP data available in OMEGAMON XE on z/OS Version 4.1.0 (1<sup>st</sup> Quarter 2007)



- Sysplex-level Workspaces where zAAP and zIIP data will be available
  - ▶ Address Spaces Workspace for Service Class Period
  - ▶ Address Spaces Workspace for Service Class
  - ▶ Address Space Workspace for Report Class
  - ▶ Workflow Analysis Workspace for Service Class
  - ▶ Workflow Analysis Workspace for Service Class Period
  - ▶ Workflow Analysis Workspace for Service Class System
  - ▶ Workflow Analysis Workspace for Service Class Period System
  - ▶ Resource Groups Data for Sysplex
  - ▶ Service Classes Workspace for Resource Group
- Address space and resource group zAAP and zIIP data is available in both real-time and historical workspaces. Workflow Analysis data is real-time only.

```

Session A - [43 x 50]
File Edit View Communications Actions Window Help
[Taskbar icons]

XMCPU10  ZMNU  YTH  OM/DEX * V550 /C J80  08/09/06 16:24:50
XMCPU10  Task  CPU%  TC%  SRR%  IFR%  IFC%  IIP%  IIC%  System %  200
* TCAS  20.8  21.5  20.3  .0  .0  .0  .0  TCB: 170 ----->
* PUBPRIC 22.8  21.6  1.2  .0  .0  .0  .0  SRR: 63 ----->
* USSMOR7 13.4  13.4  .0  .0  .0  .0  .0  NCL: 61 ----->
* GICSSARA 16.8  16.7  .0  .0  .0  .0  .0  MVS: 63 ----->
* U0220045 17.7  2.6  .0  14.3  .8  .0  .0  IFR: 23 ----->
* USSMOR6 12.9  12.9  .0  .0  .0  .0  .0  IFC: 2 ----->
*          .0  .0  .0  .0  .0  .0  .0  IIP: 0 ----->
*          .0  .0  .0  .0  .0  .0  .0  IIC: 0 ----->
*          .0  .0  .0  .0  .0  .0  .0  System % 100
* CPU00 46 ----->
* UNK01 2 ----->
* CPU02 47 ----->
* CPU03 43 ----->
* CPU04 38 ----->
* CPU05 28 ----->
* CPU06 20 ----->
* CPU07 13 ----->
* CPU08 9 ----->
* CPU09 5 ----->
* CPU0A 5 ----->
* CPU0B 4 ----->
* CPU0C 3 ----->
* CPU0D 3 ----->
* CPU0E 2 ----->
* CPU0F 3 ----->
* CPU10 3 ----->
* CPU11 2 ----->
* CPU12 2 ----->
* CPU13 3 ----->
* CPU14 3 ----->
* CPU15 3 ----->
* CPU16 3 ----->
* CPU17 3 ----->
* CPU18 3 ----->
* CPU19 2 ----->
* CPU1A 2 ----->
* CPU1B 2 ----->
* IFR18 46 ----->
* IFR1C 43 ----->
* IFR1D 9 ----->
* IIP1E 0 ----->
* PAR07 13 ----->

02/000
[Taskbar icons]

```

# Currently available zIIP and zAAP data in OMEGAMON "Classic"

# Currently available zIIP and zAAP data in OMEGAMON "Classic"

The screenshot shows the output of the XRCPUID command in OMEGAMON Classic. The output is divided into two main sections: system statistics and processor utilization.

XRCPUID	Task	ZMEM	VTR	OM/DEX	VSSG	ZC	ZIB	00/00/00	00/24/50	200
TCPM	29.0	21.0	29.2	0.0	0.0	0.0	0.0	0.0	0.0	200
PUMP12	27.0	21.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	200
USZ0007	12.0	12.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	200
CICS3000	10.0	10.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	200
USZ0005	17.7	7.0	0.0	14.0	0.0	0.0	0.0	0.0	0.0	200
USZ0006	12.0	12.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	200

CP	UNQD1	UNQD2	UNQD3	UNQD4	UNQD5	UNQD6	UNQD7	UNQD8	UNQD9	UNQD10	UNQD11	UNQD12	UNQD13	UNQD14	UNQD15	UNQD16	UNQD17	UNQD18	UNQD19	UNQD20	UNQD21	UNQD22	UNQD23	UNQD24	UNQD25	UNQD26	UNQD27	UNQD28	UNQD29	UNQD30	UNQD31	UNQD32
CP000	46	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	
CP001	42	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	
CP002	42	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	
CP003	30	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	
CP004	30	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	
CP005	20	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	
CP006	5	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	
CP007	5	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	
CP008	5	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	
CP009	4	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	
CP010	3	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	
CP011	4	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	
CP012	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	
CP013	4	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	
CP014	3	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	
CP015	3	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	
CP016	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	
CP017	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	
CP018	2	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	
CP019	2	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	
CP020	2	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	
CP021	45	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	
CP022	45	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	
CP023	0	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	
CP024	0	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	
CP025	13	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	

- Command output where zAAP and zIIP data is available
  - ▶ SIFA IFA% and IFA% on CP by address space and enclaves
  - ▶ SIIP zIIP% and zIIP% on CP by address space and enclaves
  - ▶ MCPU Added IFA and zIIP Utilization by address space, enclaves and processor
  - ▶ DEX Added IFA/zIIP execution delay reasons to address space bottleneck analysis
  - ▶ IANL Added IFA/zIIP impactors to address space impact analysis
  - ▶ SYS Added IFA/zIIP configuration information to system environment details
  - ▶ AENV Added IFA/zIIP percentages to address space environment details
  - ▶ TRAC Added IFA/zIIP to address space resource utilization by time-slice
  - ▶ XACB Added IFA/zIIP missing processor exceptions to XACB LIST=XCPU

# SIFA Immediate Command – Address Space zAAP data



Session A - [43 x 80]

File Edit View Communication Actions Window Help

Session A - [43 x 80]

SIFA00	Task	ZMENU	VTM	OM/DEX	* V550./C	J80	08/09/06	17:49:21
	IFAF%		0	100	200	300	400	IFA on CP%
+	WSP1S28	.68	>	.	.	.	.	.10
+	WP0AGN8	.21	>	.	.	.	.	.08
+	U0220034	3.16	>	.	.	.	.	.39
+	WP1SR34S	.25	>	.	.	.	.	.04
+	WSP1S18	.58	>	.	.	.	.	.10
+	WSP1A8	.60	>	.	.	.	.	.14
+	CTGJ81	.02	>	.	.	.	.	.00
+	CTGJ80	.02	>	.	.	.	.	.00
+	WSP1S98	.85	>	.	.	.	.	.16
+	WSP1S68	.74	>	.	.	.	.	.10
+	JAY8601	.21	>	.	.	.	.	.02
+	WSP1S48	.58	>	.	.	.	.	.10
+	WSP1S58	.76	>	.	.	.	.	.10
+	CICSCA8C	.54	>	.	.	.	.	.02
+	U0220018	23.90	>	.	.	.	.	3.90
+	WP1DMGS	.02	>	.	.	.	.	.02
+	WP1SR35	.02	>	.	.	.	.	.00
+	WSP1S38S	20.70	>	.	.	.	.	6.20
+	WP1DMG	.50	>	.	.	.	.	.02
+	CICSCA8B	.25	>	.	.	.	.	.02
+	WP0DMGR	.23	>	.	.	.	.	.06
+	WP1SR35S	.45	>	.	.	.	.	.04
+	CICSCA8A	.17	>	.	.	.	.	.00
+	WSP1S98S	1.32	>	.	.	.	.	3.90
+	WSP1M	2.07	>	.	.	.	.	2.83
+	WSP1S38	5.27	>	.	.	.	.	3.26
+	WP0DMGRS	.02	>	.	.	.	.	.00
+	WSP1S28S	.06	>	.	.	.	.	.00
+	WSP1S58S	.02	>	.	.	.	.	.00
+	WSP1S68S	.02	>	.	.	.	.	.00
+	WSP1S18S	.02	>	.	.	.	.	.00
+	WSP1S48S	.02	>	.	.	.	.	.00
+	WSP1MS	.02	>	.	.	.	.	.02
+	Enclaves	.21	>	.	.	.	.	.06
+	Totals	64.50	>	.	.	.	.	21.63

MA a 03/004

# SIIP Immediate Command – Address Space zIIP data



Session A - [43 x 80]

File Edit View Communication Session A - [43 x 80] Help

SIIP00 Task IIP% ZMENU VTM OM/DEX \* V550./C J80 08/09/06 18:02:20

SIIP00	Task	IIP%	ZMENU	VTM	OM/DEX	* V550./C	J80	08/09/06	18:02:20
+	DBWIDIST	.00	>	.	.	.	.00	>	.
+	Enclaves	.01	>	.	.	.	.00	>	.
+	Totals	.01	>	.	.	.	.00	>	.

MA a 02/006

# MCPU Immediate Command



Session A - [43 x 80]

File Edit View Communication Actions Window Help

XMCPU02	Task	ZMENU	VTM	OM/DEX	* V550	/C	I80	08/09/06	18:04:57
	XCFAS	17.1	.1	17.0	IFA%	IFC%	IIP%	IIC%	System % 0
	WLM	5.4	4.6	.8	.0	.0	.0	.0	TCB: 160
	OMVS	4.4	.6	3.8	.0	.0	.0	.0	SRB: 57
	SMS	3.4	.7	2.6	.0	.0	.0	.0	NCL: 54
	PURFPIH	25.0	23.9	1.1	.0	.0	.0	.0	MVS: 42
	USSWORK7	12.1	12.1	.0	.0	.0	.0	.0	IFA: 15
	IMS8	5.4	3.9	1.5	.0	.0	.0	.0	IFC: 58
	VTAM44	8.2	.5	7.7	.0	.0	.0	.0	IIP: 0
	TCPIP	6.0	.1	5.9	.0	.0	.0	.0	IIC: 0
	WSP1S28	6.5	.4	.1	.9	5.2	.0	.0	0
	CICSC28A	3.0	2.0	1.0	.0	.0	.0	.0	100
	RMFGAT	7.4	5.9	1.5	.0	.0	.0	.0	CPU00 44
	CIC3A8A	11.0	11.0	.0	.0	.0	.0	.0	UNK01 3
	CSQ8CHIN	15.1	13.4	1.7	.0	.0	.0	.0	CPU02 44
	WSP1S18	5.3	.2	.1	.7	4.3	.0	.0	CPU03 38
	WSP1A8	8.5	.2	.1	1.1	7.2	.0	.0	CPU04 30
	WSP1S98	9.0	1.1	.2	1.5	6.2	.0	.0	CPU05 24
	WWS7	3.5	2.6	.9	.0	.0	.0	.0	CPU06 21
	WSP1S68	19.3	.5	.2	3.9	14.8	.0	.0	CPU07 16
	WSP1S48	5.1	.2	.1	.9	4.0	.0	.0	CPU08 8
	WSP1S58	5.2	.1	.1	1.0	4.1	.0	.0	CPU09 13
	CIC3A8B	3.0	3.0	.0	.0	.0	.0	.0	CPU0A 8
	TPA8NOAQ	2.3	2.2	.1	.0	.0	.0	.0	CPU0B 9
	USSWORK5	11.7	11.7	.0	.0	.0	.0	.0	CPU0C 6
	CICSCA8C	3.7	3.3	.1	.2	.1	.0	.0	CPU0D 4
	CICSCA8B	7.4	6.0	.6	.5	.2	.0	.0	CPU0E 4
	USSWORK8	11.7	11.7	.0	.0	.0	.0	.0	CPU0F 7
	CICSCA8A	2.0	1.6	.3	.1	.0	.0	.0	CPU10 5
	WSP1M	5.8	.2	.1	1.3	4.3	.0	.0	CPU11 6
	WSP1S38	6.4	.2	.1	.7	5.3	.0	.0	CPU12 5
	USSWORK6	11.6	11.6	.0	.0	.0	.0	.0	CPU13 3
									CPU14 4
									CPU15 6
									CPU16 4
									CPU17 4
									CPU18 7
									CPU19 4
									CPU1A 6
									IFA1B 26
									IFA1C 28
									IIP1D 0
									IIP1E 0
									PAR07 12

# Dexan MONJ Minor – Bottleneck Analysis



Session A - [43 x 80]

File Edit View Communication Actions Window Help

```

JOBNN      WSP1S68      ZMENU      VTM      OM/DEX * V550./C J80  08/11/06 10:59:49
DEX       >> DX0000 V550 running. Cycles=275  STIM=2.2  Elap=10:05 MN  <<
>begn    >> DX1000 The data collector started.  Workarea size=1854210690 bytes <
monj01   WSP1S68  ASID=476  %      | 0  1  2  3  4  5  6  7  8  9  0 |
+ Using CPU           3.4         | >  .  .  .  .  .  .  .  .  .  . |
+ Using IFA           1.3         | >  .  .  .  .  .  .  .  .  .  . |
+ Using IFA On CP     .4         | >  .  .  .  .  .  .  .  .  .  . |
+ ECB Wait (w/ STIMER) 90.9        | >  ----->>>>>>>>>>>>>>>>>> |
+ Waiting for IFA     2.2         | >  .  .  .  .  .  .  .  .  .  . |
+ waiting for CPU     .7         | >  .  .  .  .  .  .  .  .  .  . |
+ ECB Wait            .4         | >  .  .  .  .  .  .  .  .  .  . |

monj02   DBW1DIST  ASID=411  %      | 0  1  2  3  4  5  6  7  8  9  0 |
+ Using CPU           15.0        | >  -----> .  .  .  .  .  .  .  . |
+ Using IIP           11.1        | >  -----> .  .  .  .  .  .  .  . |
+ ECB Wait (w/ STIMER) 76.8        | >  ----->>>>>>>>>>>>>>>>>> |
+ Waiting for CPU     .8         | >  .  .  .  .  .  .  .  .  .  . |
+ ECB Wait            .8         | >  .  .  .  .  .  .  .  .  .  . |
    
```

13/002



```

Session A - [43 x 80]
File Edit View Communication Actions Window Help
Receive files from host
----- ZMENU      VTM      OM/DEX * V550./C J80  08/09/06 19:39:35
SYS  >> WLM Goal mode OPT=00 SYSRES=(PETPA0,1406) <<
env_ z/OS      01.08.00 running in Logical partition 7 on 2094
+    IPLed at 16:40:12 on 08/08/06 RMF 7.1.8 is active >> ASID <<
+    ESCON Status: Enabled ESCON Director: In Configuration
+    WLM Mode=Goal
+    IFAs: 02                                IFA Relative Processor Speed: 1.00:1
+                                           IFA Honor Priority: Yes
+    IIPs: 02                                IIP Relative Processor Speed: 1.00:1
+                                           IIP Honor Priority: Yes
MA a
03/005
    
```



```
Session A - [43 x 80]
File Edit View Communication Actions Window Help Session A - [43 x 80]
JOBN      WSP1S68      ZMENU      VTM      OM/DEX      V550./C J80      08/11/06 10:30:25
ifac.     .2
ifac.%%   1.4
ifac.%%   2.8
ifac      709.90
ifac      1973.89
ifac      3405.10

JOBN      DBW1DIST
iipc.     7.2
iipc.%%   7.3
iipc.%%   6.1
iipc      9030.10
iipc      9114.90
iipc      6084.17
iipc      84.79

-

MA a 25/008
```

## Summary

- OMEGAMON XE on z/OS Version 3.1.0 provides full support for zAAP and, with available maintenance, zIIP processors at the LPAR level
- OMEGAMON XE on z/OS Version 4.1.0 (G.A. 1<sup>st</sup> Quarter 2007) will extend LPAR-level support in the current release to the Sysplex-level.
- OMEGAMON for MVS “Classic” Version 550 provides full support for zAAP and, with available maintenance, zIIP processors at the LPAR level