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 (1st Quarter 2007)
- Currently available zIIP and zAAP data in OMEGAMON “Classic”

Overview of zIIPs and zAAPs
zAAP (IBM System **z** **A**pplication **A**ssist **P**rocessor)

- 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 **z**9 **I**ntegrated **I**nformation **P**rocessor)

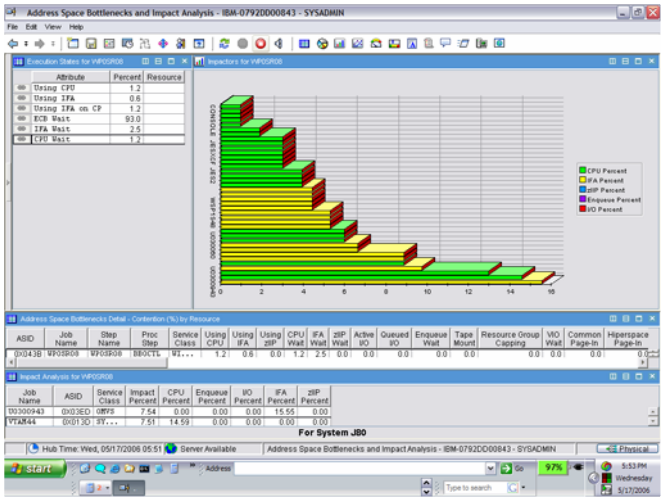
- Introduced 2006, designed to help improve resource optimization for eligible data workloads within the enterprise.
- Requires z9 platform (IBM System z9 BC, IBM System z9 EC)
- Operating system support introduced in z/OS Version 1.8. Available via maintenance in z/OS Versions 1.6 and 1.7.
- zIIP-eligible 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

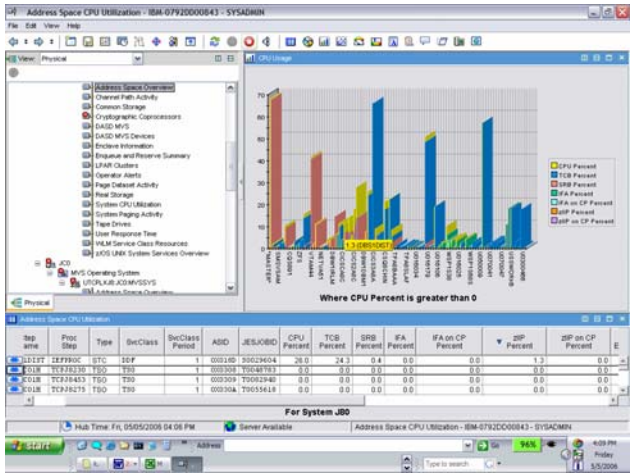
- PROJECTCPU=YES|NO
  - z/OS Version 1.8 (and Versions 1.6 and 1.7 with zIIP maintenance) support a SYS1.PARMLIB(IEAOPTxx) keyword PROJECTCPU.
  - When PROJECTCPU=YES is specified both zAAP-eligible and zIIP-eligible workloads will populate various zAAP and zIIP z/OS internal zAAP On CP and zIIP On CP 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

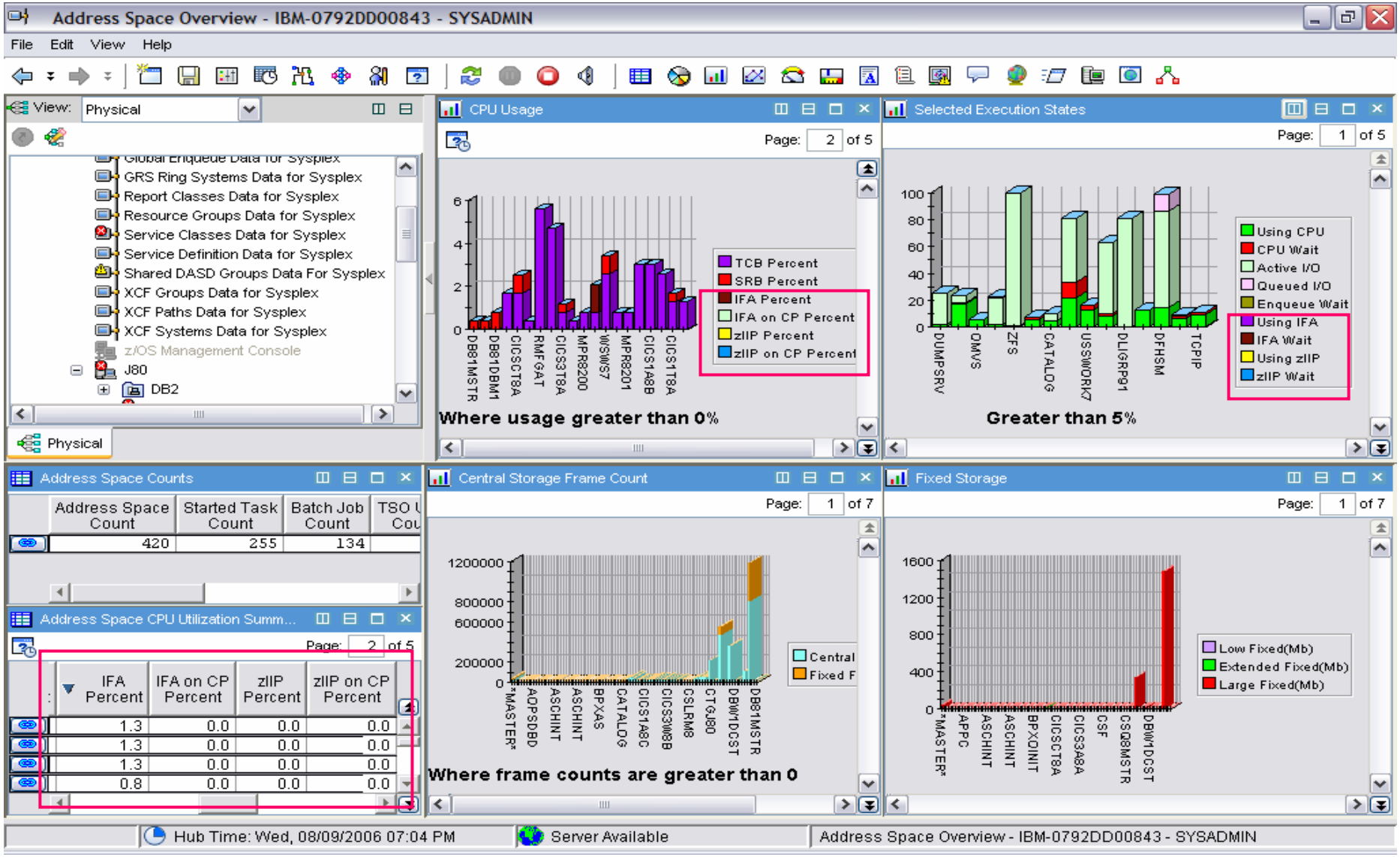


- LPAR-level Workspaces where zAAP and zIIP data is available
  - Address Space Overview
  - Address Space CPU Utilization Summary
  - Address Space CPU Utilization
  - Address Space Bottlenecks Summary
  - Address Space Bottlenecks Detail
  - Address Space Bottlenecks and Impact Analysis
  - Enclave 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

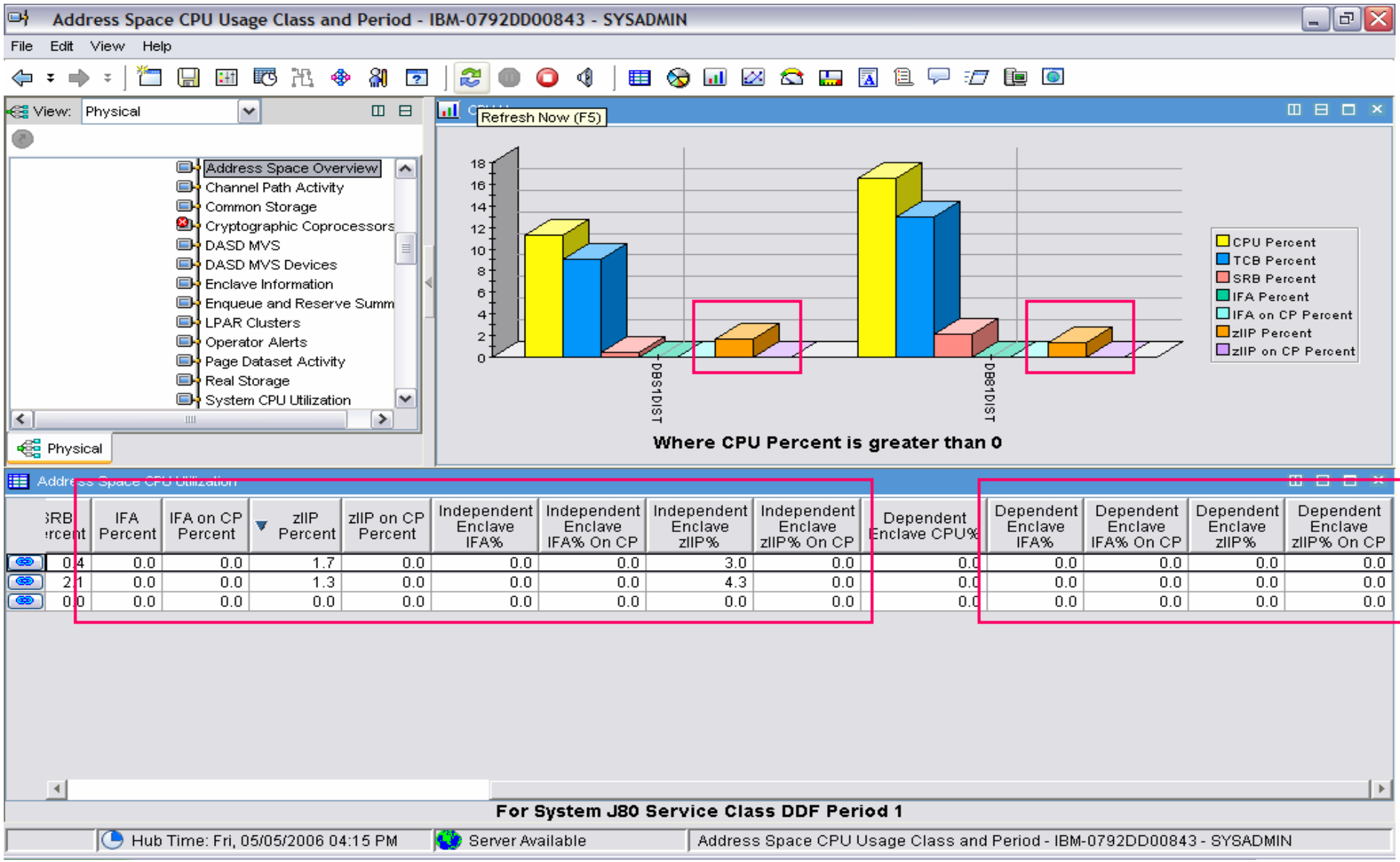
Currently available zIIP and zAAP data in OMEGAMON XE on z/OS Version 3.1.0

- 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



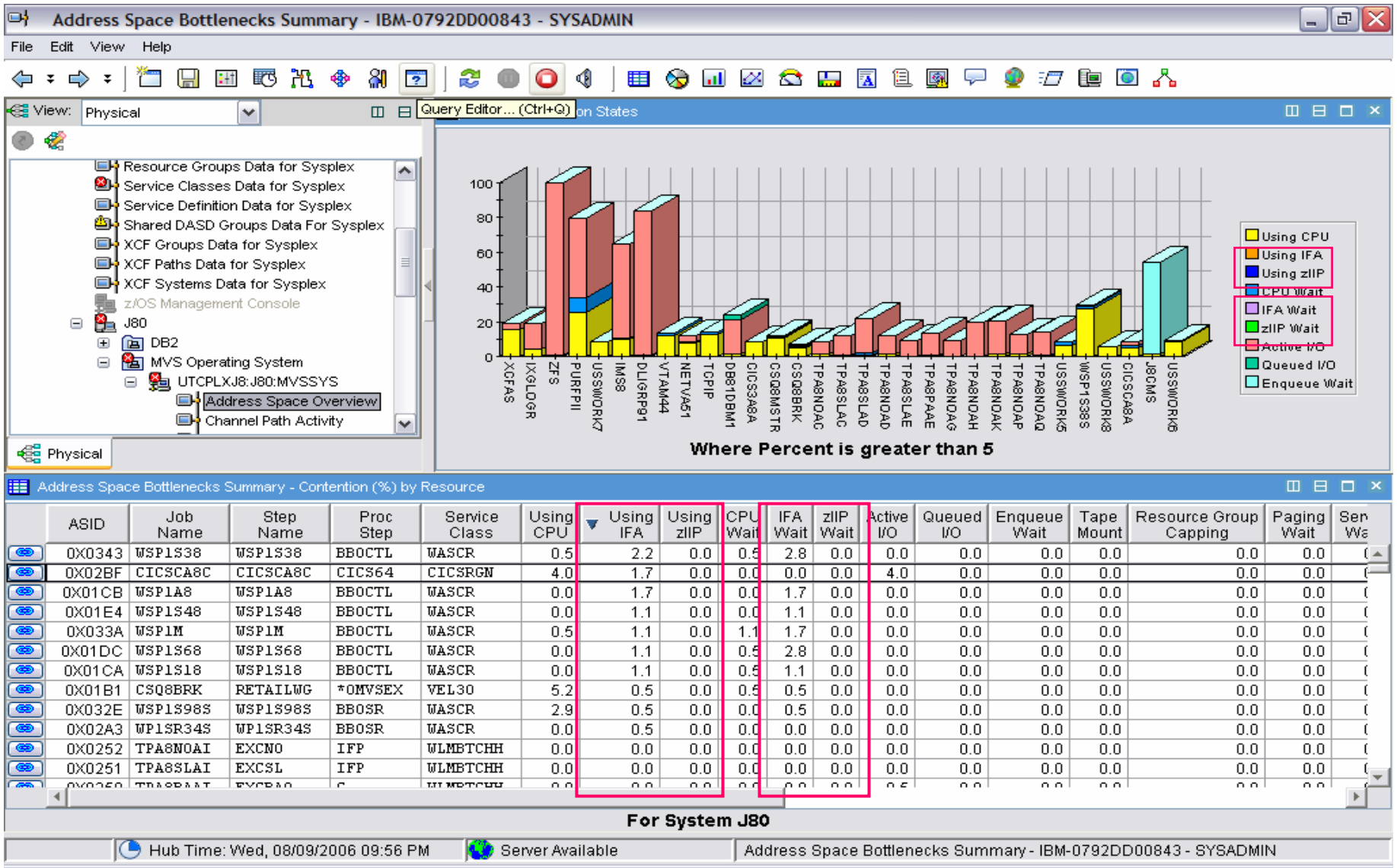
Address Space CPU Usage



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.

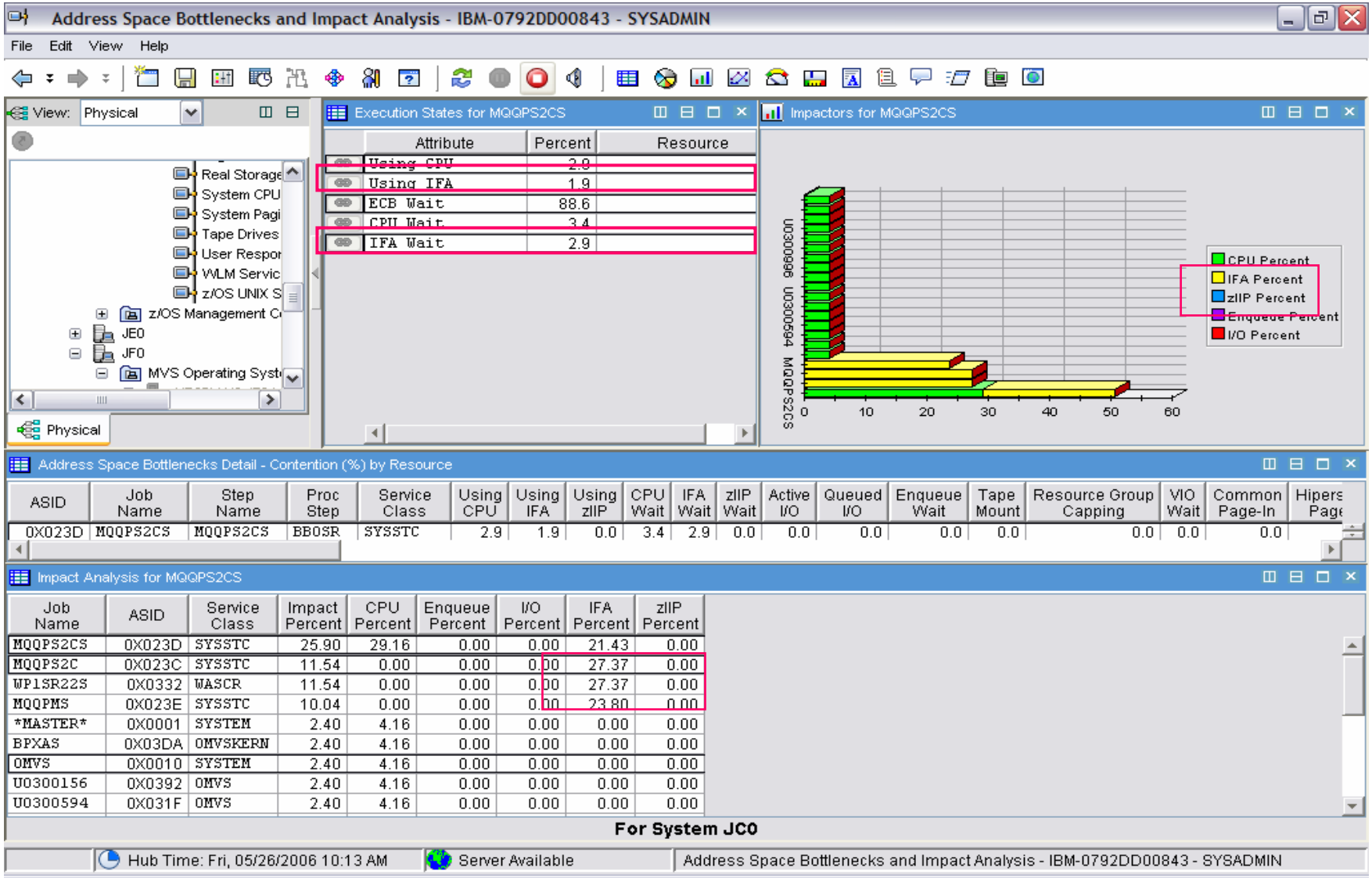
Address Space Bottlenecks Summary



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.

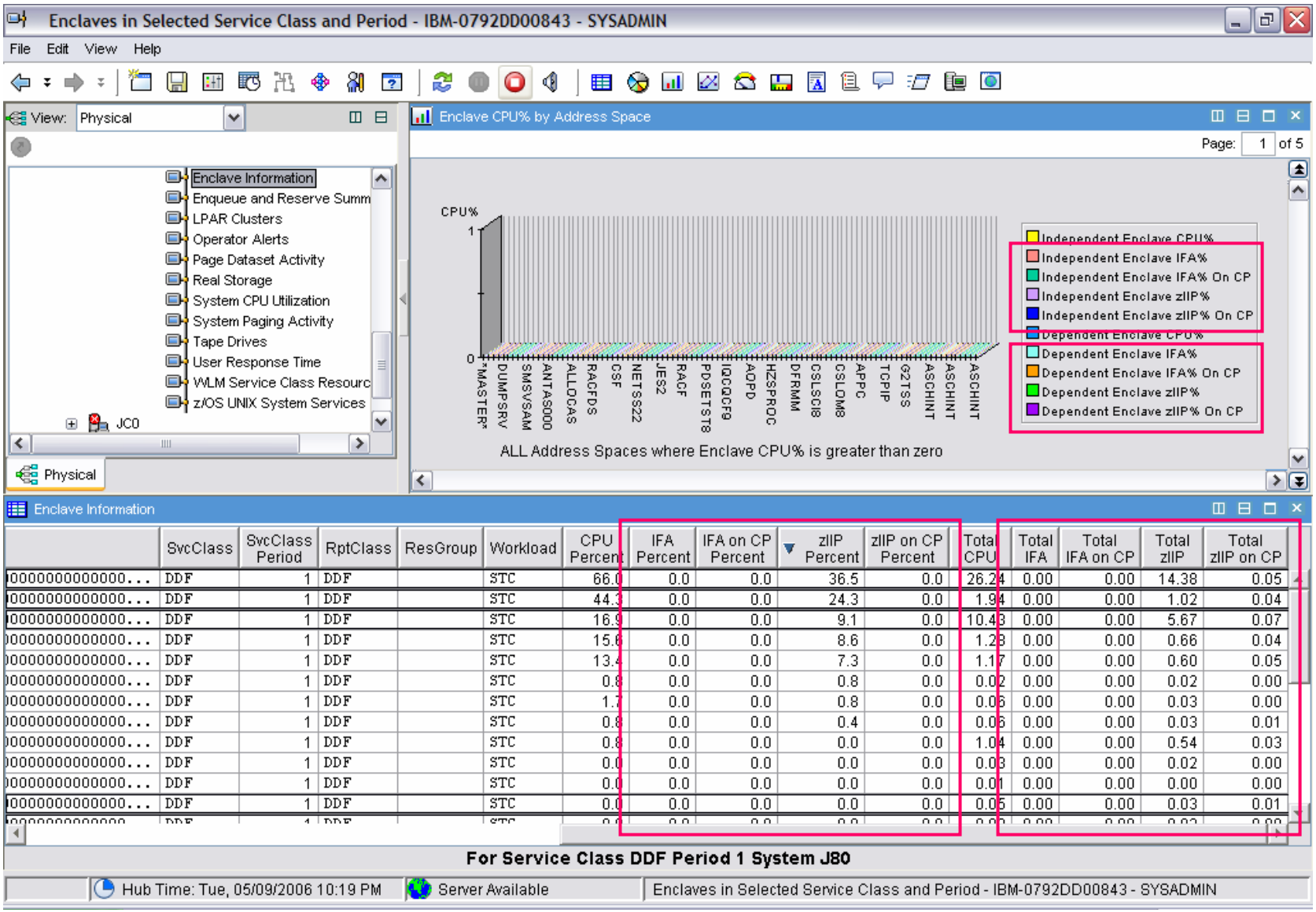
Address Space Bottlenecks and Impact Analysis



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

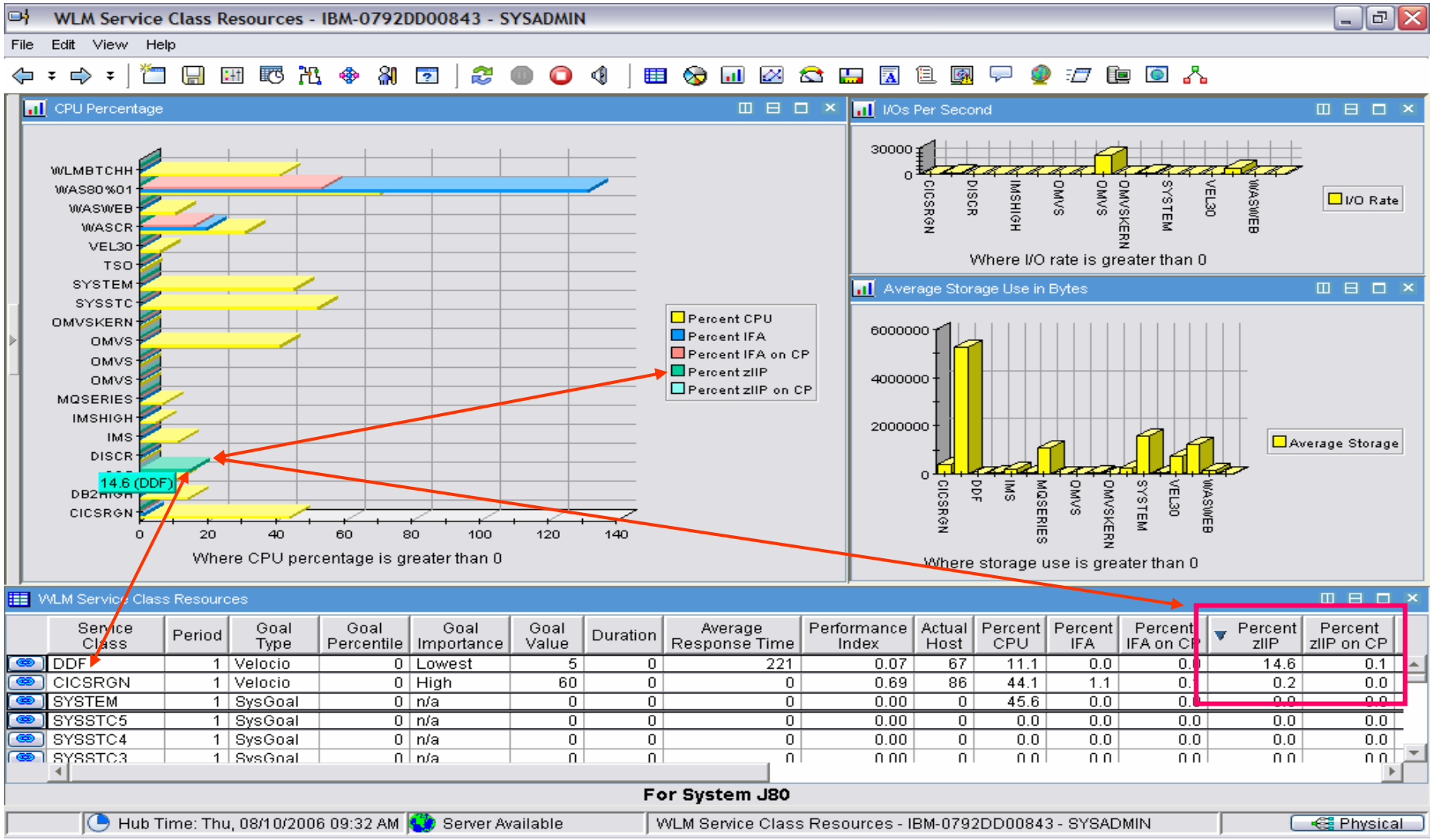
Enclave Information



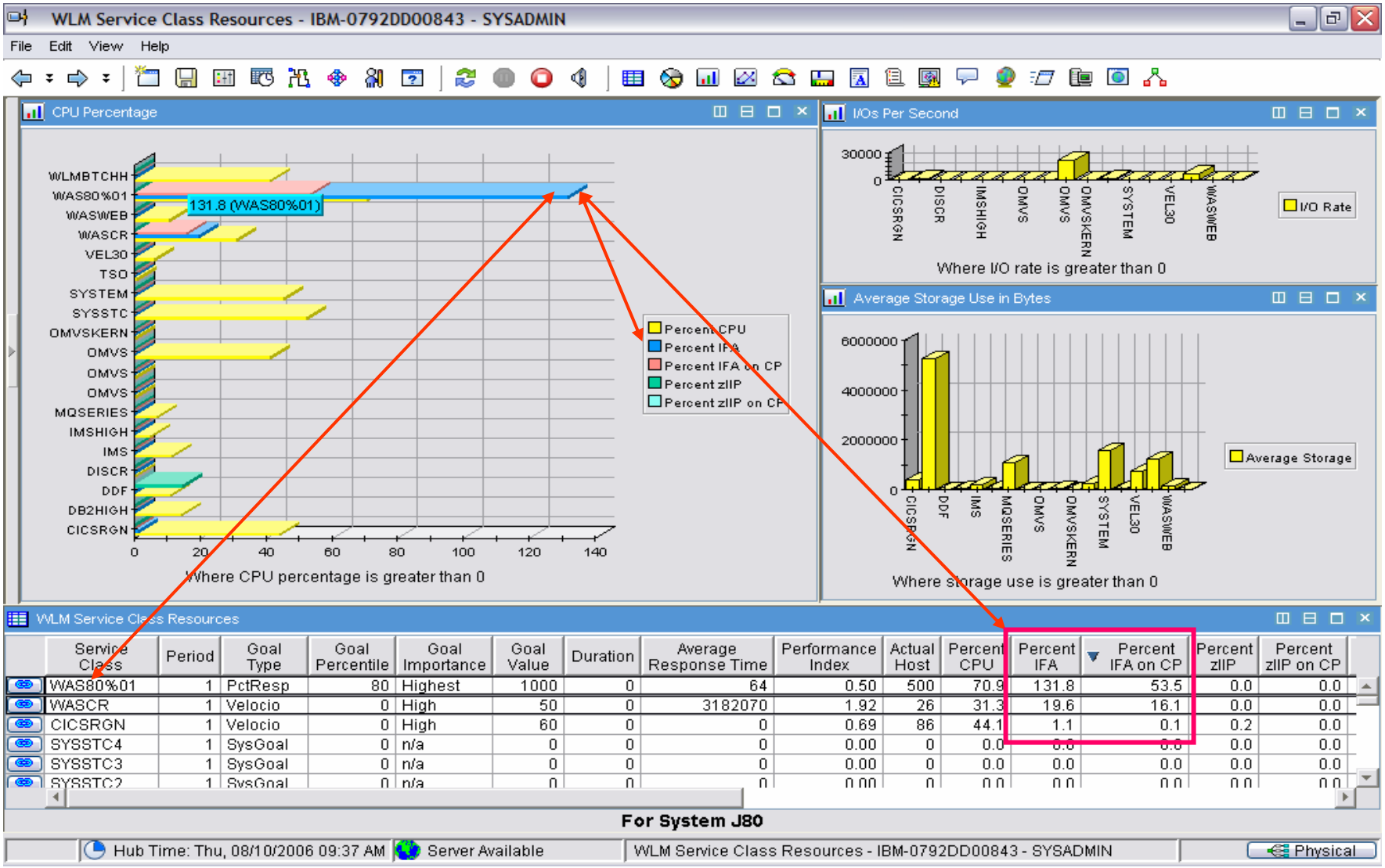
Currently available zIIP and zAAP data in OMEGAMON XE on z/OS Version 3.1.0

- 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



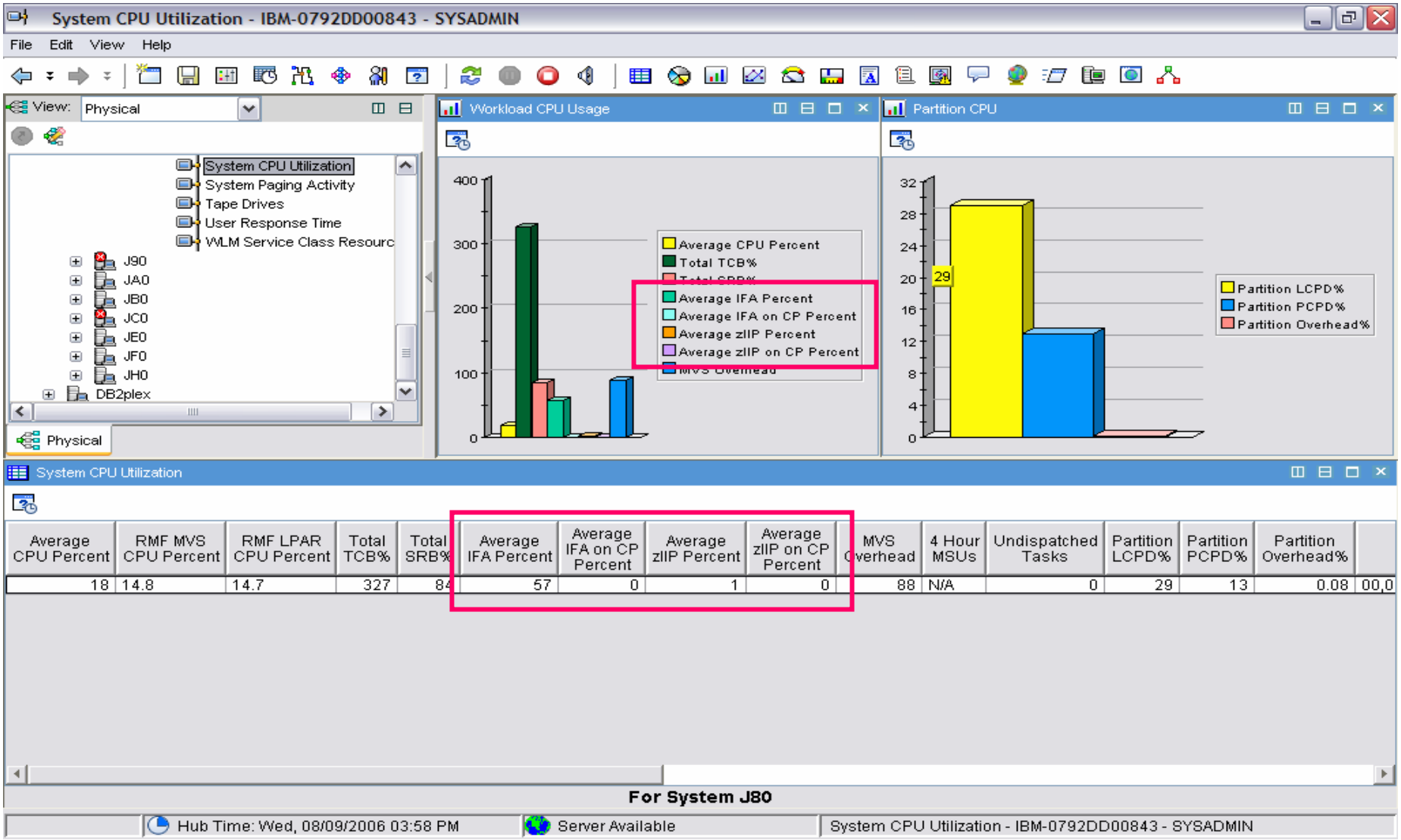
WLM Service Class Resources



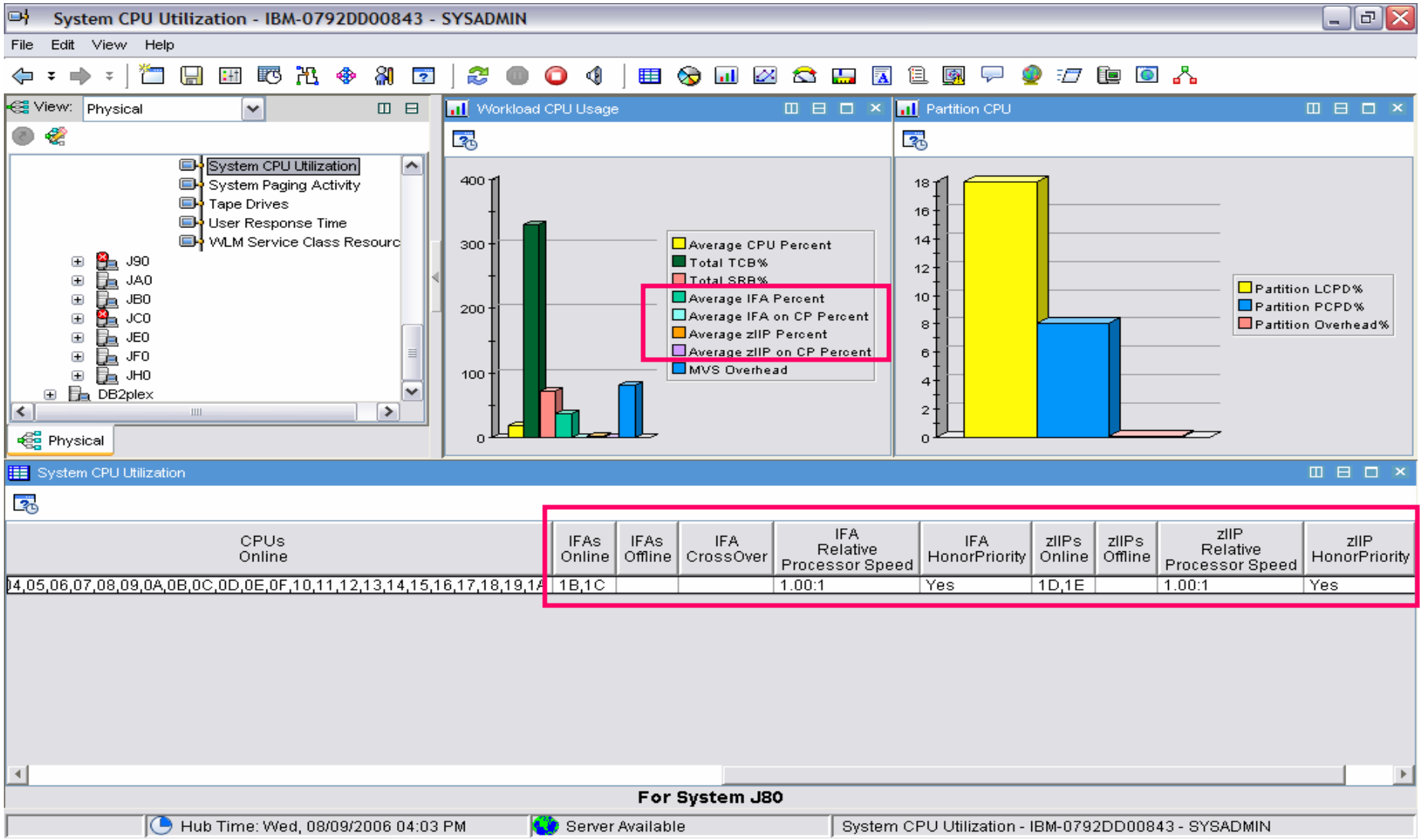
Currently available zIIP and zAAP data in OMEGAMON XE on z/OS Version 3.1.0

- 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)

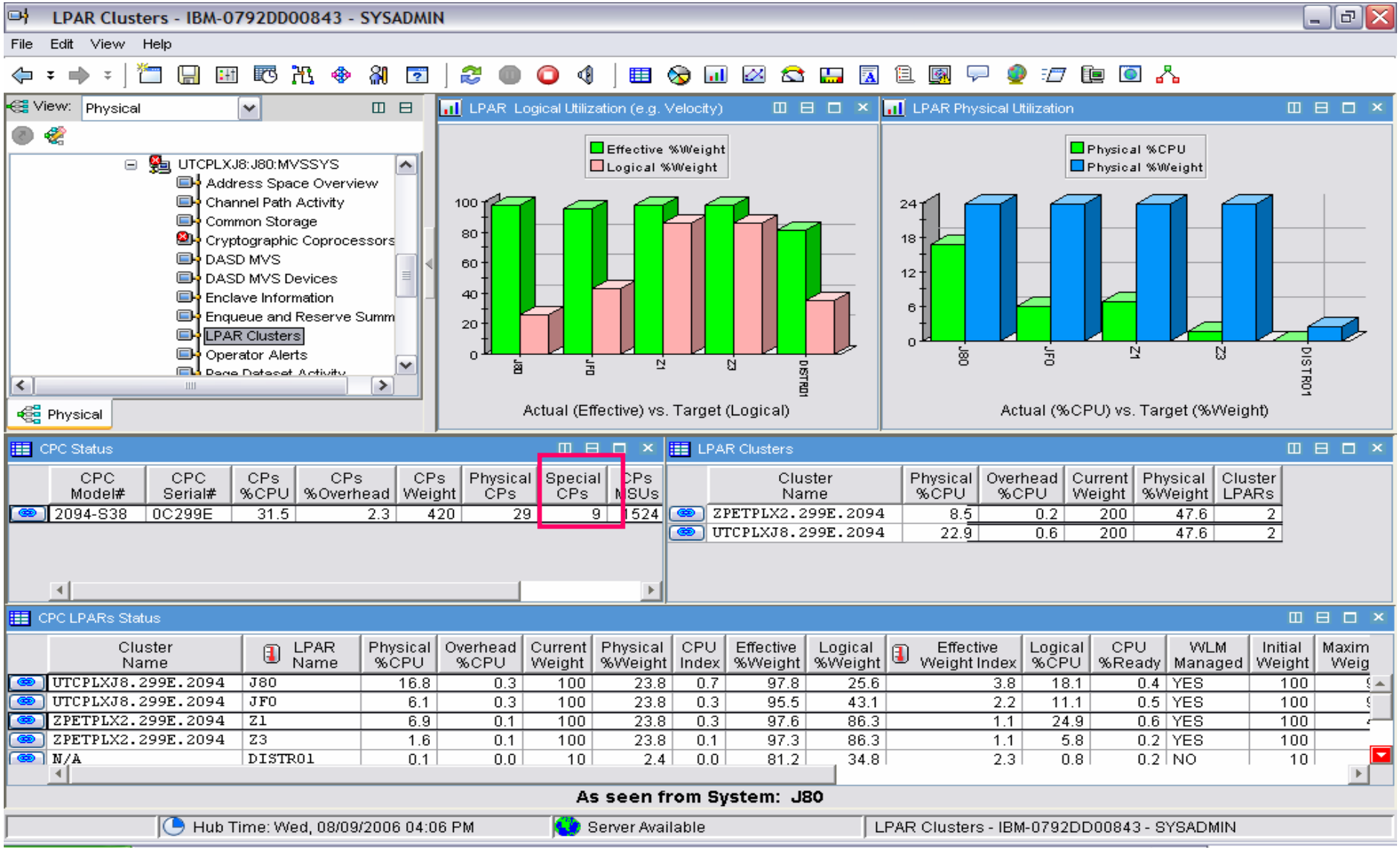
System CPU Utilization

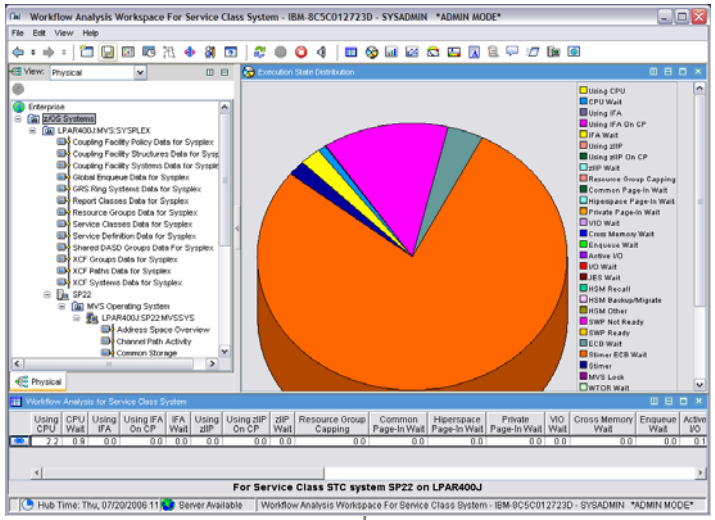


System CPU Utilization



LPAR Clusters





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

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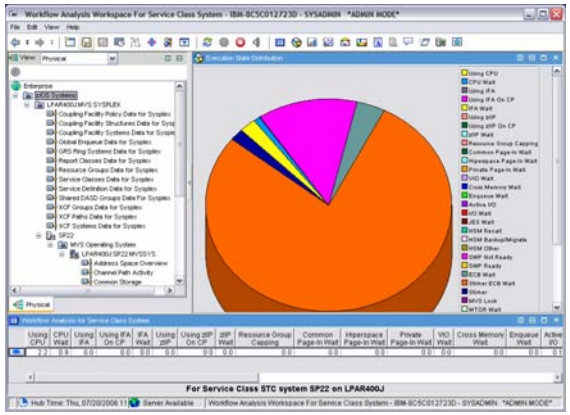
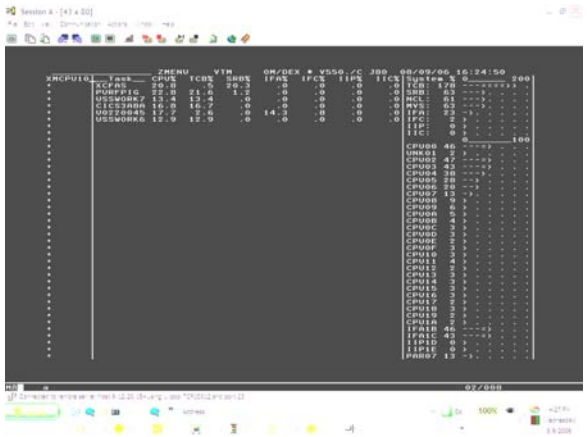


- Sysplex-level Workspaces where zAAP and zIIP data will be available
  - Address Spaces Workspace for Service Class Period
  - Address Spaces Workspace for Service Class
  - Address Space Workspace for Report Class
  - Workflow Analysis Workspace for Service Class
  - Workflow Analysis Workspace for 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.

Currently available
zIIP and zAAP data in OMEGAMON “Classic”

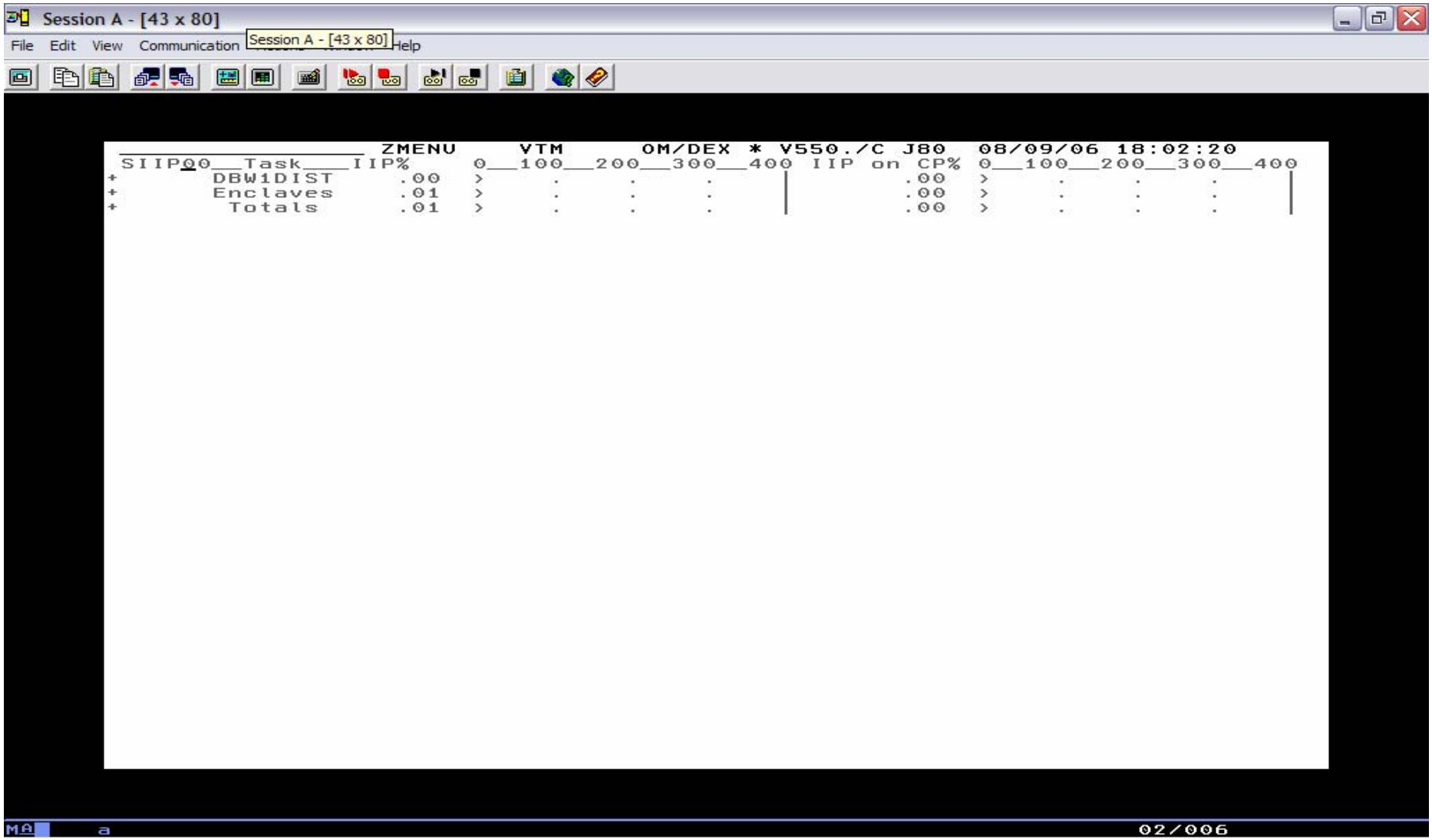
Currently available zIIP and zAAP data in OMEGAMON “Classic”



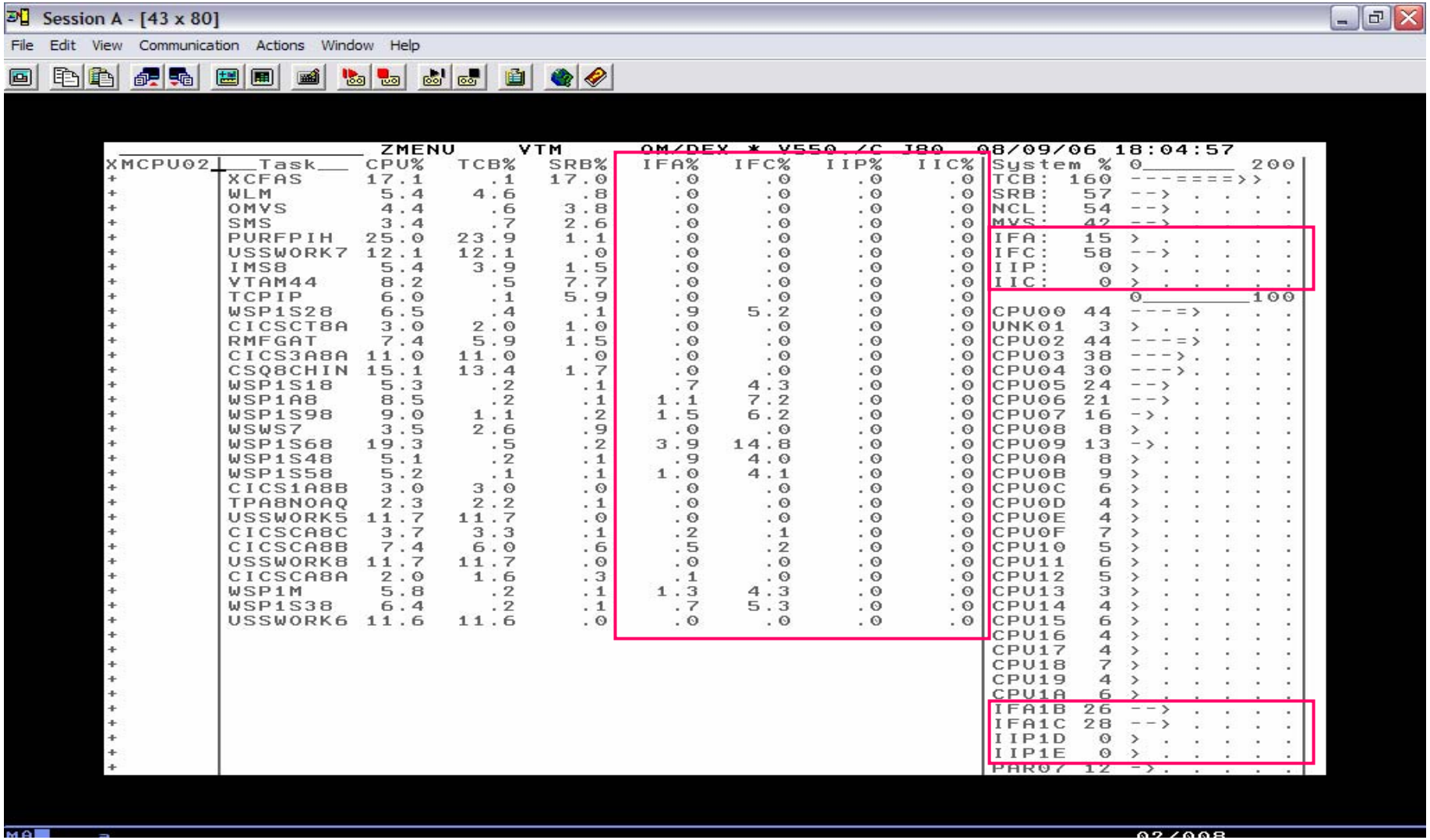
- Command output where zAAP and zIIP data is available
  - SIFA — IFA% and IFA% on CP by address space and enclaves
  - SIIP — zIIP% and zIIP% on CP by address space and enclaves
  - MCPU — Added IFA and zIIP Utilization by address space, enclaves and processor
  - DEX — Added IFA/zIIP execution delay 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

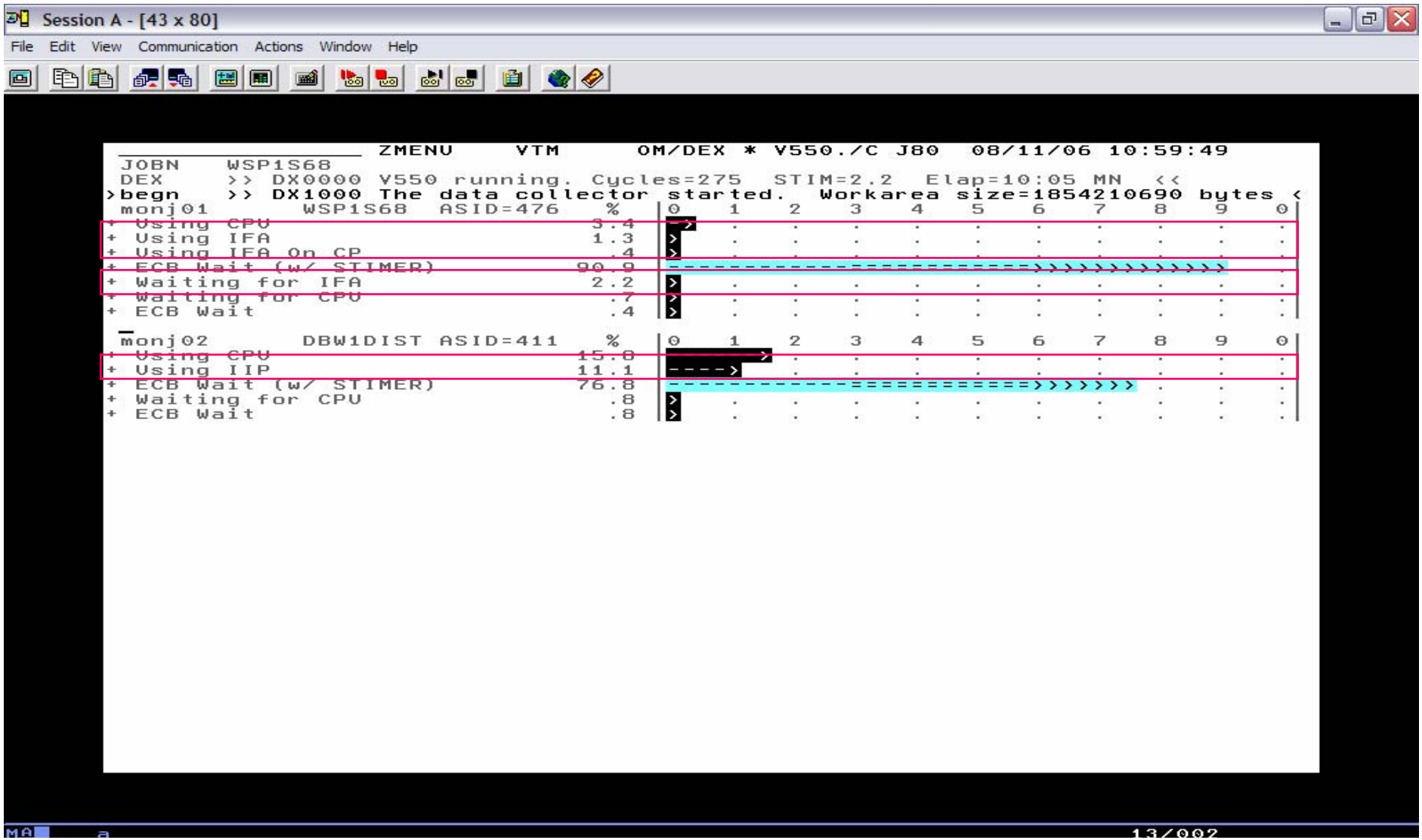
$IIP Immediate Command – Address Space zIIP data



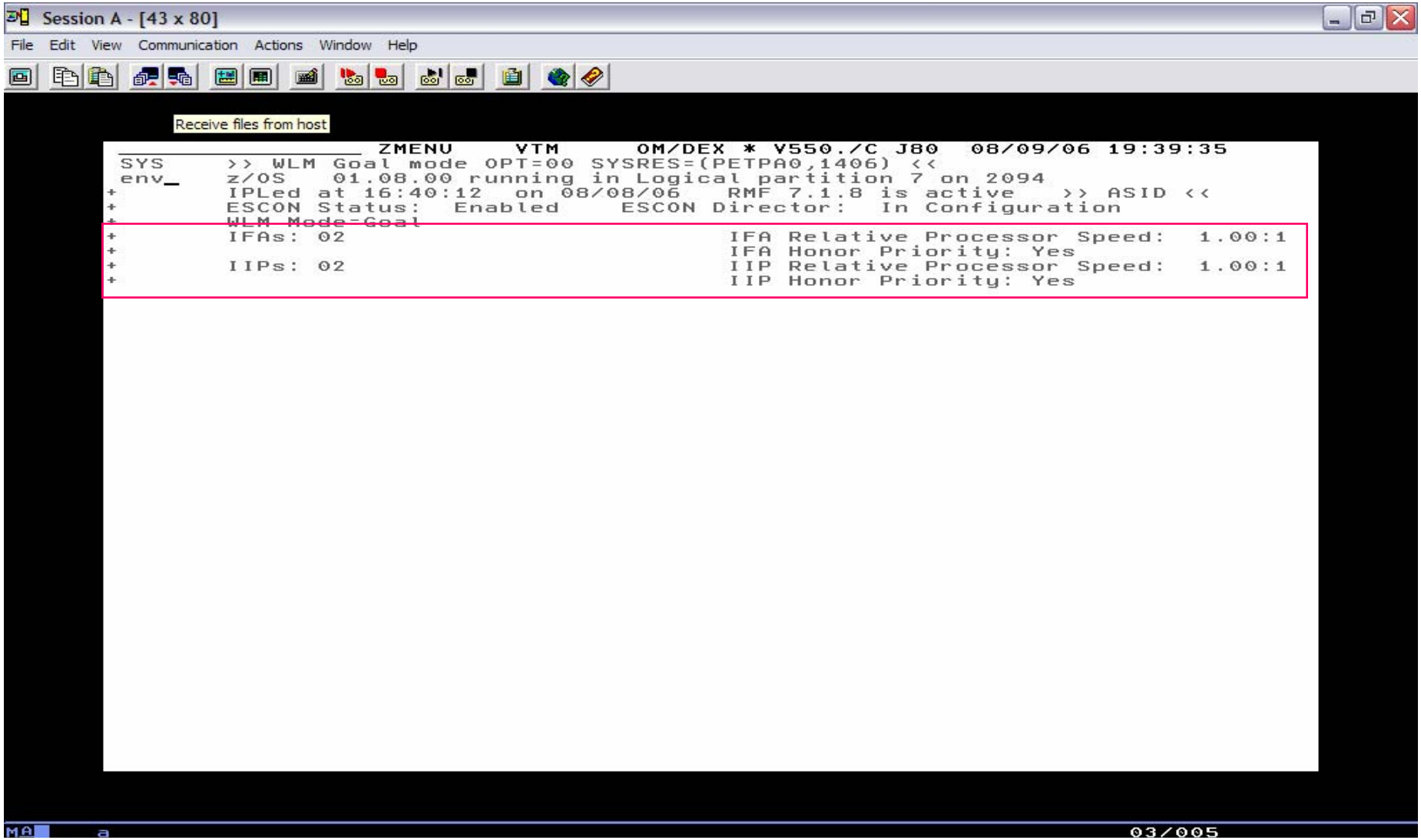
MCPU Immediate Command



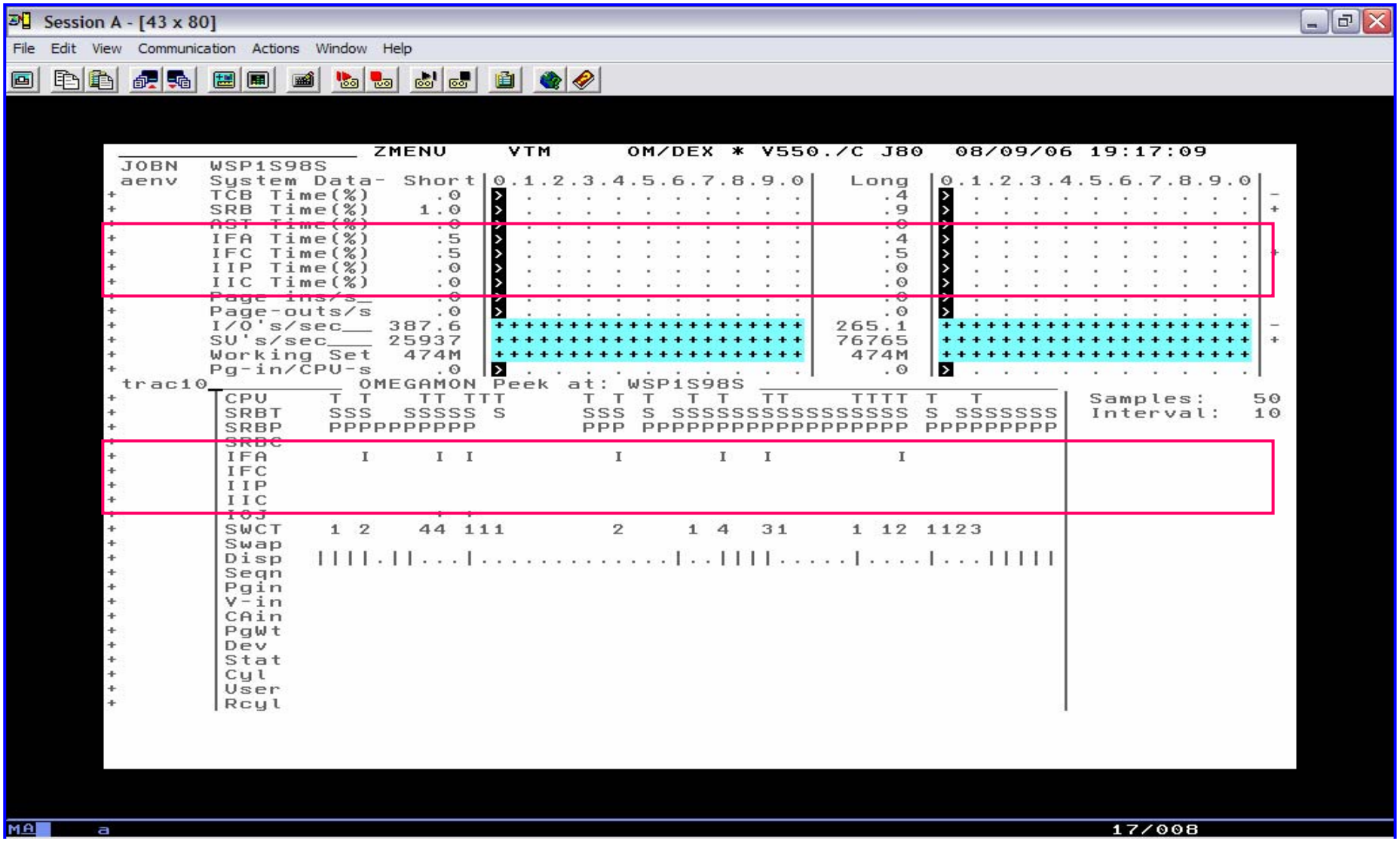
Dexan MONJ Minor – Bottleneck Analysis



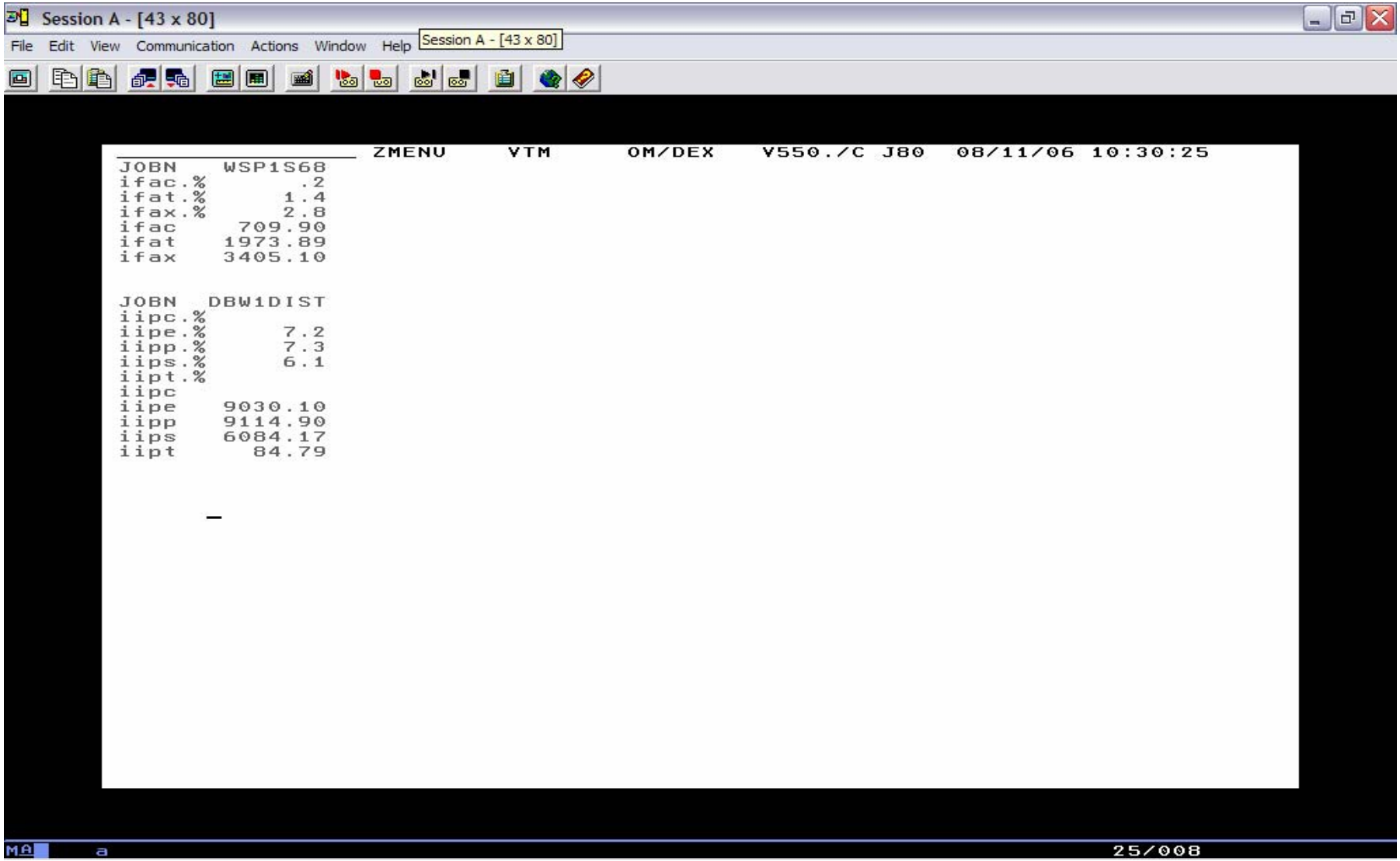
ENV Minor Command – System Environment Configuration



AENV and TRAC Address Space Minor Commands



Other Address Space zAAP and zIIP Minor Commands



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. 1st 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