z/VM and Linux Performance Management

New Product Overview

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Agenda

- Opportunity
  - New work loads
  - New monitoring needs
- Previous products
  - OMEGAMON for z/VM
  - z/VM Performance Toolkit
- New product
  - A monitoring infrastructure - TMS
  - Solution architecture – big animal pictures
  - Scenarios
- Workspaces

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Opportunity

- New workload
  - Linux on zSeries/System z
  - WAS, DB2, Java
  - Migration
- Performance
  - Real and Virtual resources
  - Monitoring needs
  - Managing needs
- Complex environment
  - Software stack
  - End to end needs

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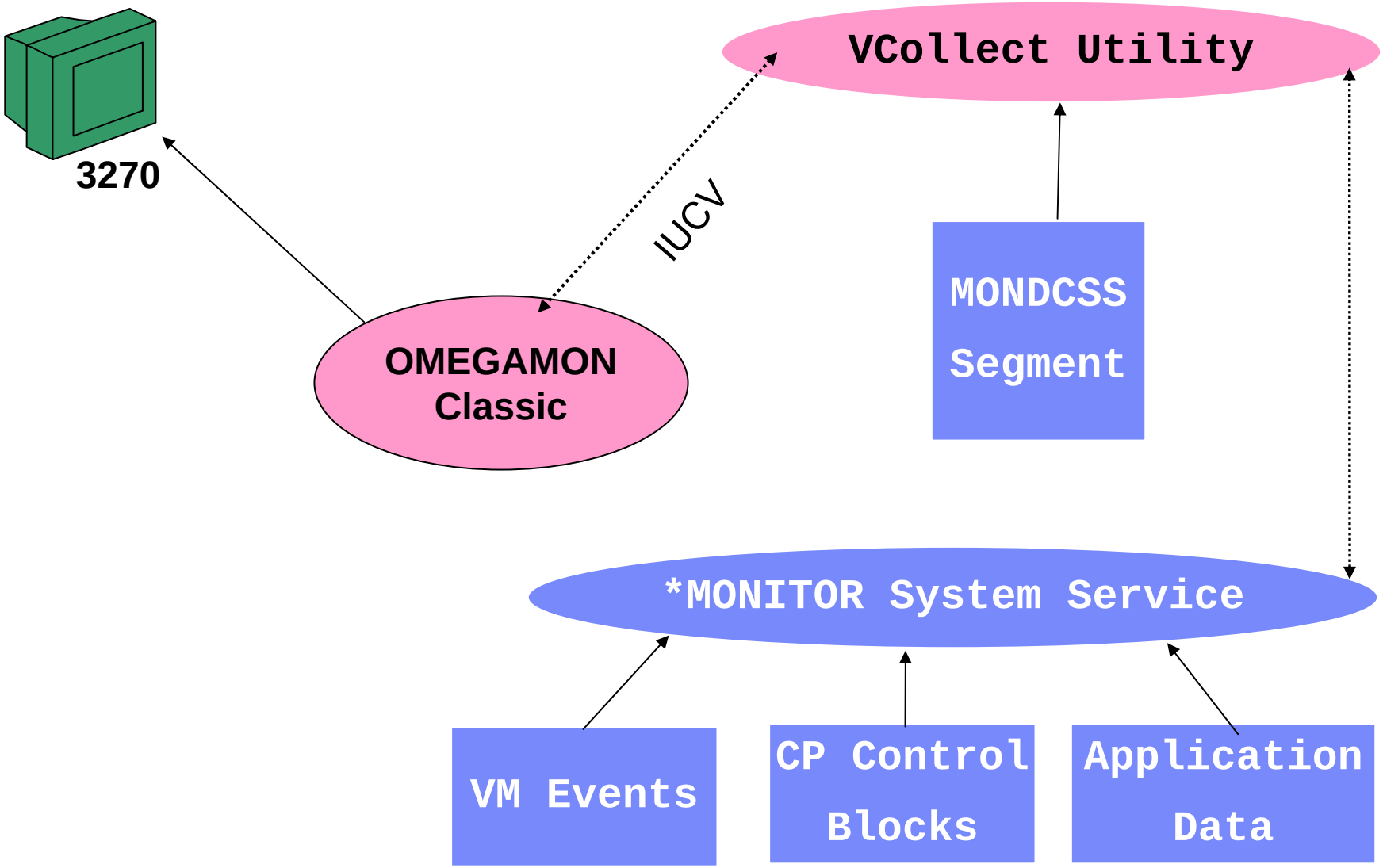
OMEGAMON for z/VM – 5000 foot View



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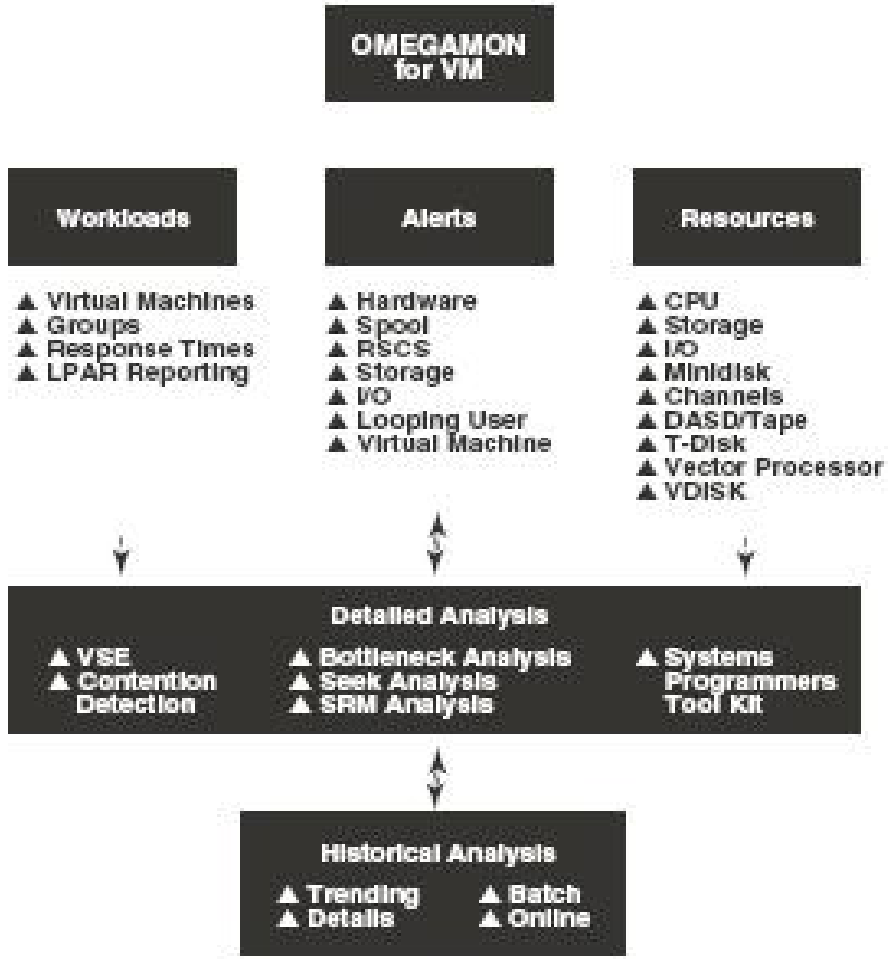
OMEGAMON for z/VM

- **What is OMEGAMON Classic?**
  - A software performance monitor for the z/VM operating system.
  - Contains both a Real-Time and Historical collection component.
  - Used to analyze system health and diagnose problems.
  - Used to monitor system resource/workloads and pro-actively report potential problems.
  - Used to perform trend analysis and capacity planning.
  - “Green-screen” product, menu or command line driven.
  - Each instance a data collector, plus VCOLLECT for historical data.
  - Not used by OMEGAMON XE on z/VM Linux.



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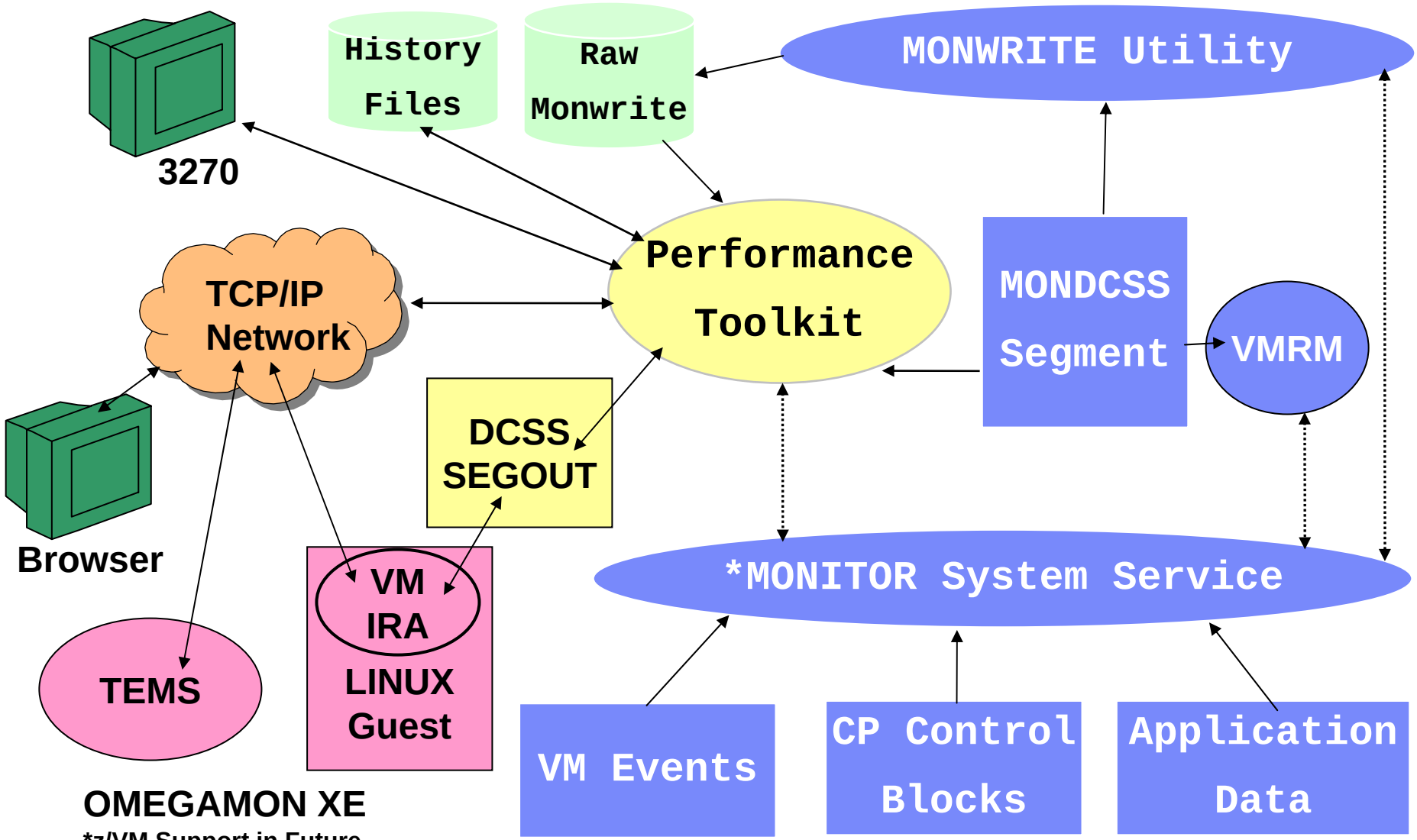
z/VM Performance Toolkit Overview - 5,000 Foot View



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z/VM Performance Toolkit Overview

- Full-Screen operator console (FCON)
- Real Time performance monitor capability for z/VM.
  - CPU Performance
  - Storage Utilization
  - Channel, I/O Device Performance
  - Detailed I/O Analysis
  - Detailed User Performance data
  - TCP/IP Server Performance
  - Linux Performance data
- 3270 interface, with ability to exploit GDDM graphics.
- Some web server capability.
- Some ability to customize screens.
- Some integration with other platform monitors (Linux).

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Other Performance Toolkit Functions

- Exception reporting
- Threshold monitoring
- Looping User management
- User Defined Screens
- User Classes - grouping
- Multiple VM System Management
- Regular Report Generation
- Linux Data
  - Linux Kernel VM Appldata
  - RMFPM Interface
- Benchmarking of
  - Users
  - Devices

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TMS Overview

An Integrated Monitoring Approach

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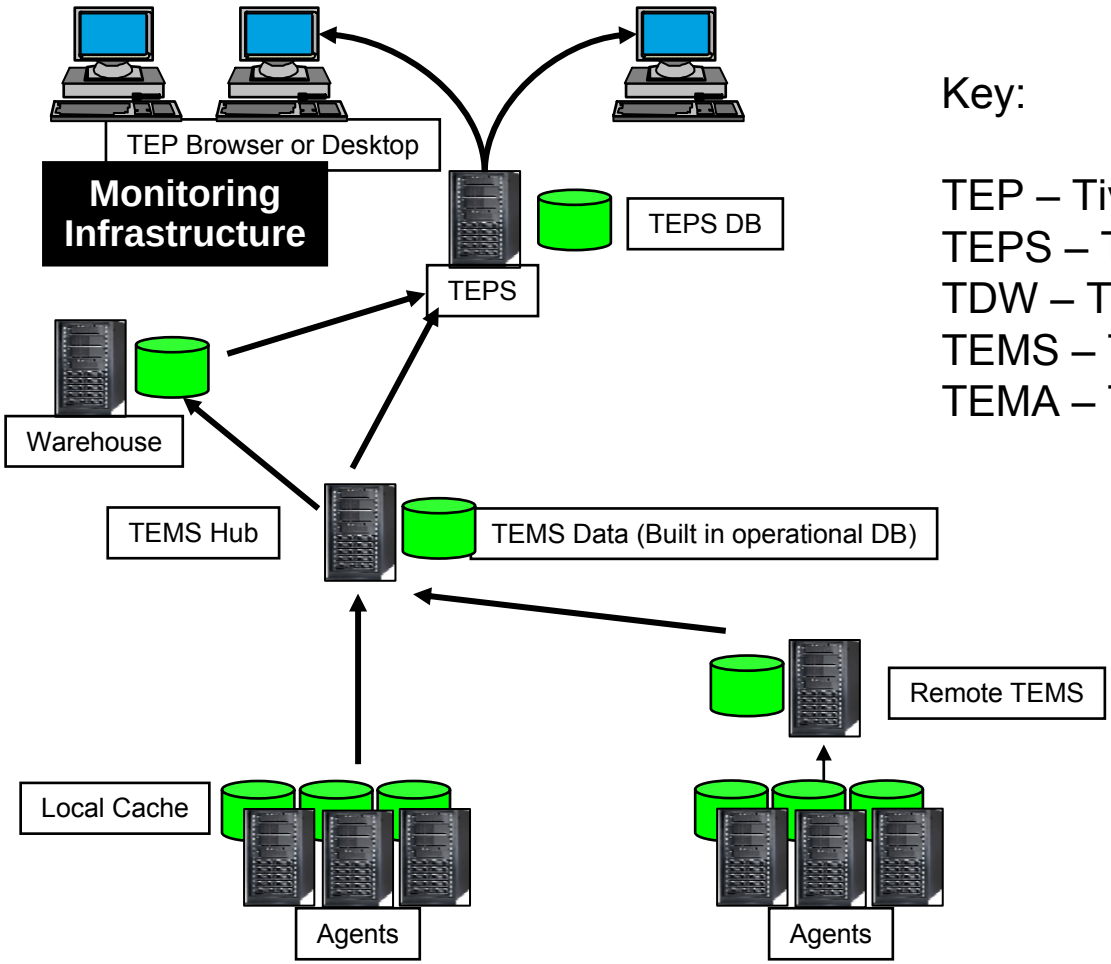
TMS/OMEGAMON XE Architecture Overview



Key:

TEP – Tivoli Enterprise Portal
TEPS – Tivoli Enterprise Portal Server
TDW – Tivoli Data Warehouse
TEMS – Tivoli Enterprise Monitoring Server
TEMA – Tivoli Enterprise Monitoring Agent

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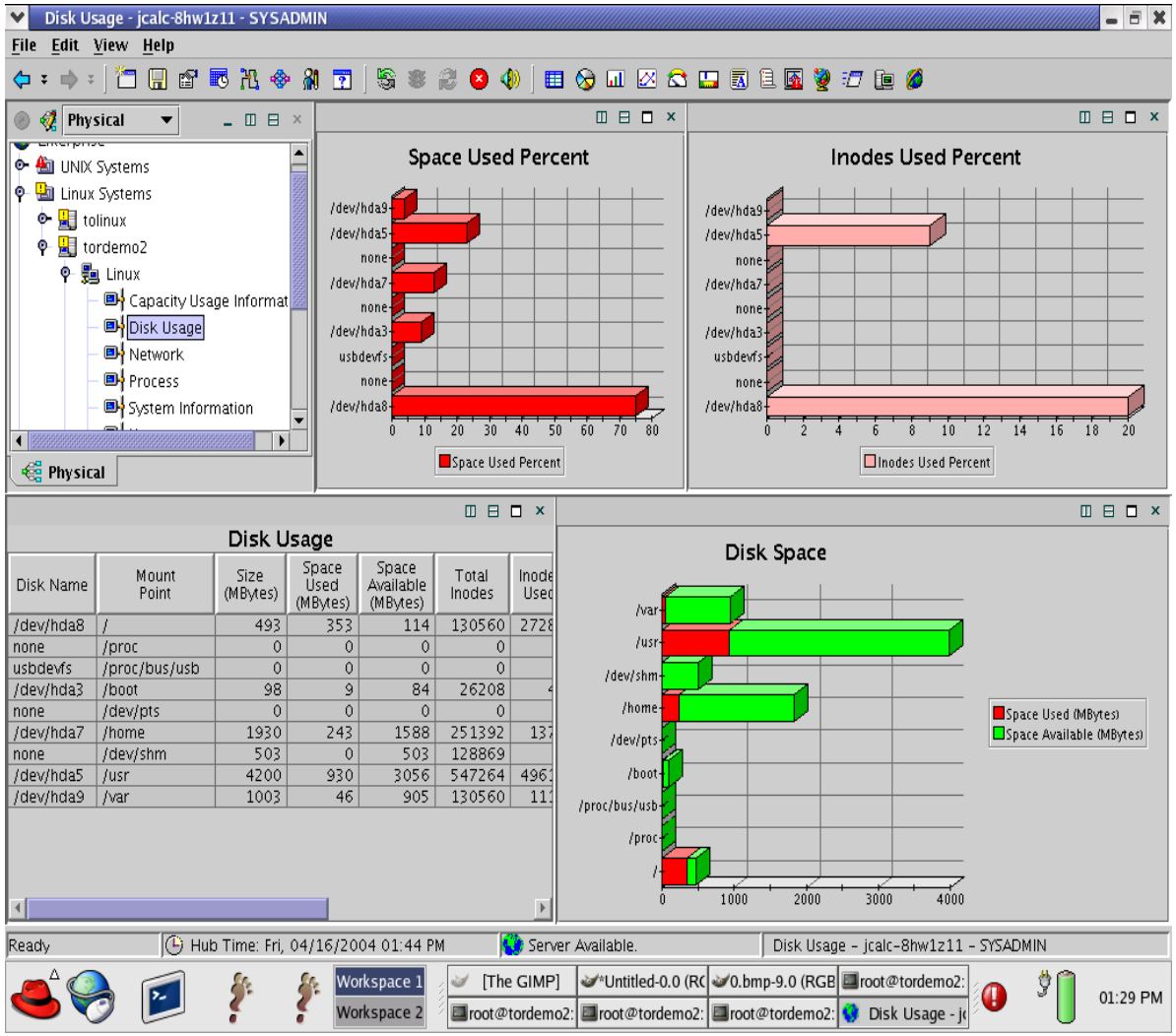
TEPS/TEMS Function

- Principal User Interface
  - End users
  - Administrators
- Browser-based or desktop application
- Flexible formatting
  - Multiple Views per Workspace
  - Discrete Queries to populate each View
  - Many ways to represent data
  - Many navigation options



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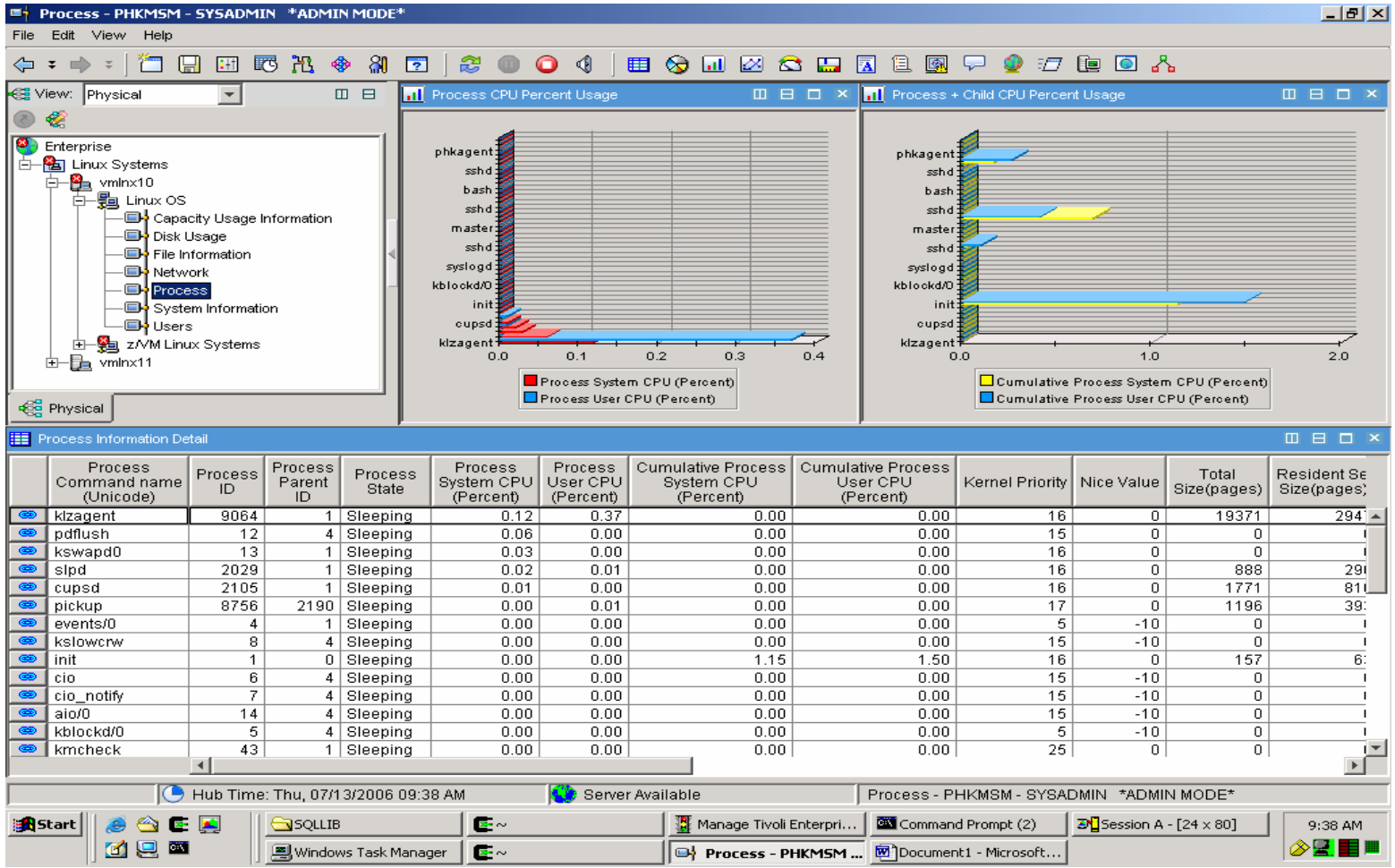
Workspaces



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Tivoli Enterprise Portal (TEP)

- **Tivoli Enterprise Portal provides the user interface for ITM & OMEGAMON monitors, and integrating applications**
- **The TEP Application Window has a number of components:**
  - Navigator
    - Tree like view of monitored environment
    - Shows alert icons when problems arise
    - You can create custom navigator views
  - Workspaces
    - Presents information to the user
    - Displayed as one or more Views
    - Pre-defined workspaces provided
    - Workspaces can be created and customized
  - Views
    - Displays data from agents
    - Based on queries and filters from agent data
    - You can define links to go directly to specific views

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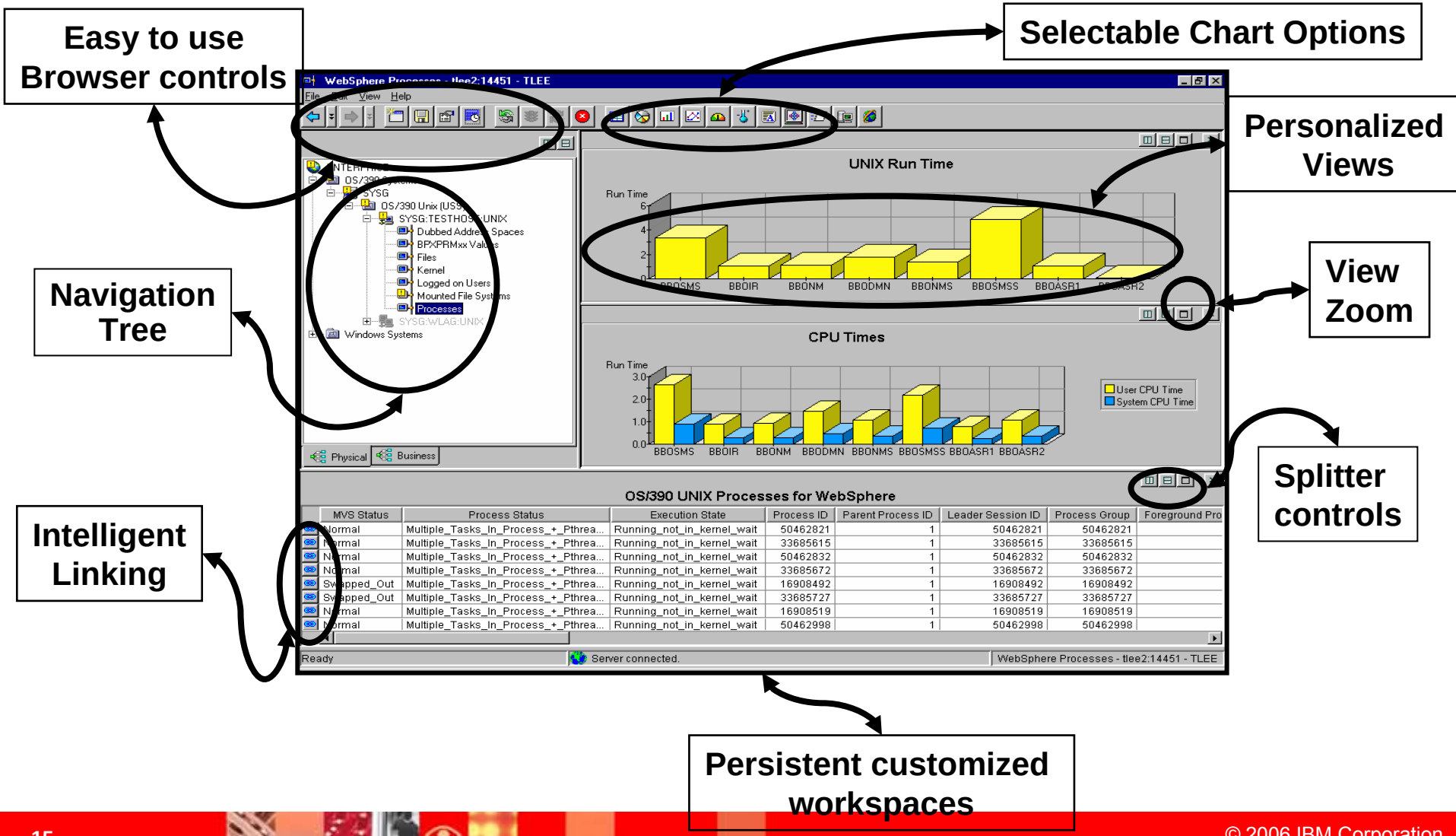
Tivoli Enterprise Portal

Improve your ability to Diagnose and Resolve Problems



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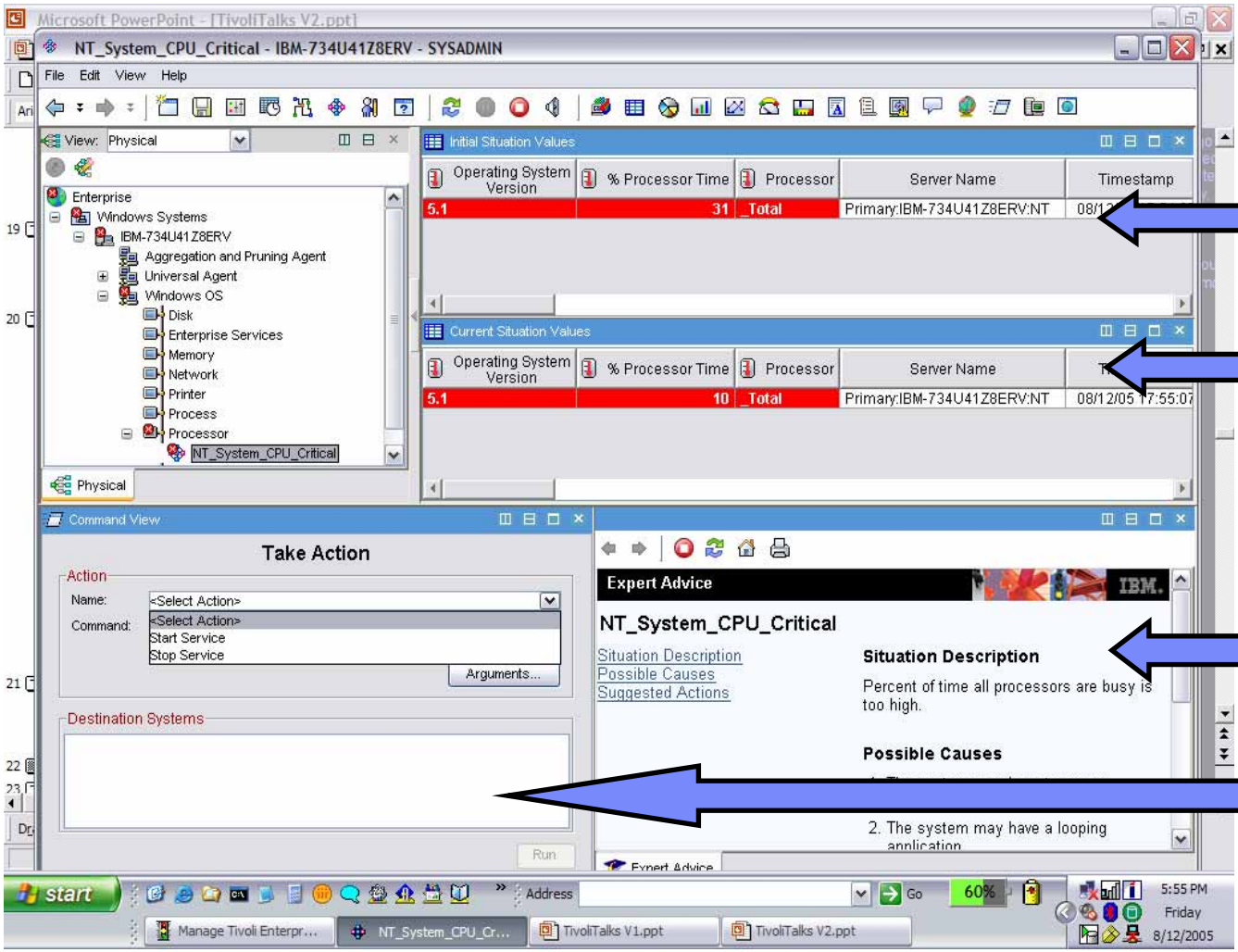
Situation Analysis



Initial Cause

Current State

Expert Advice

Take action to fix the problem

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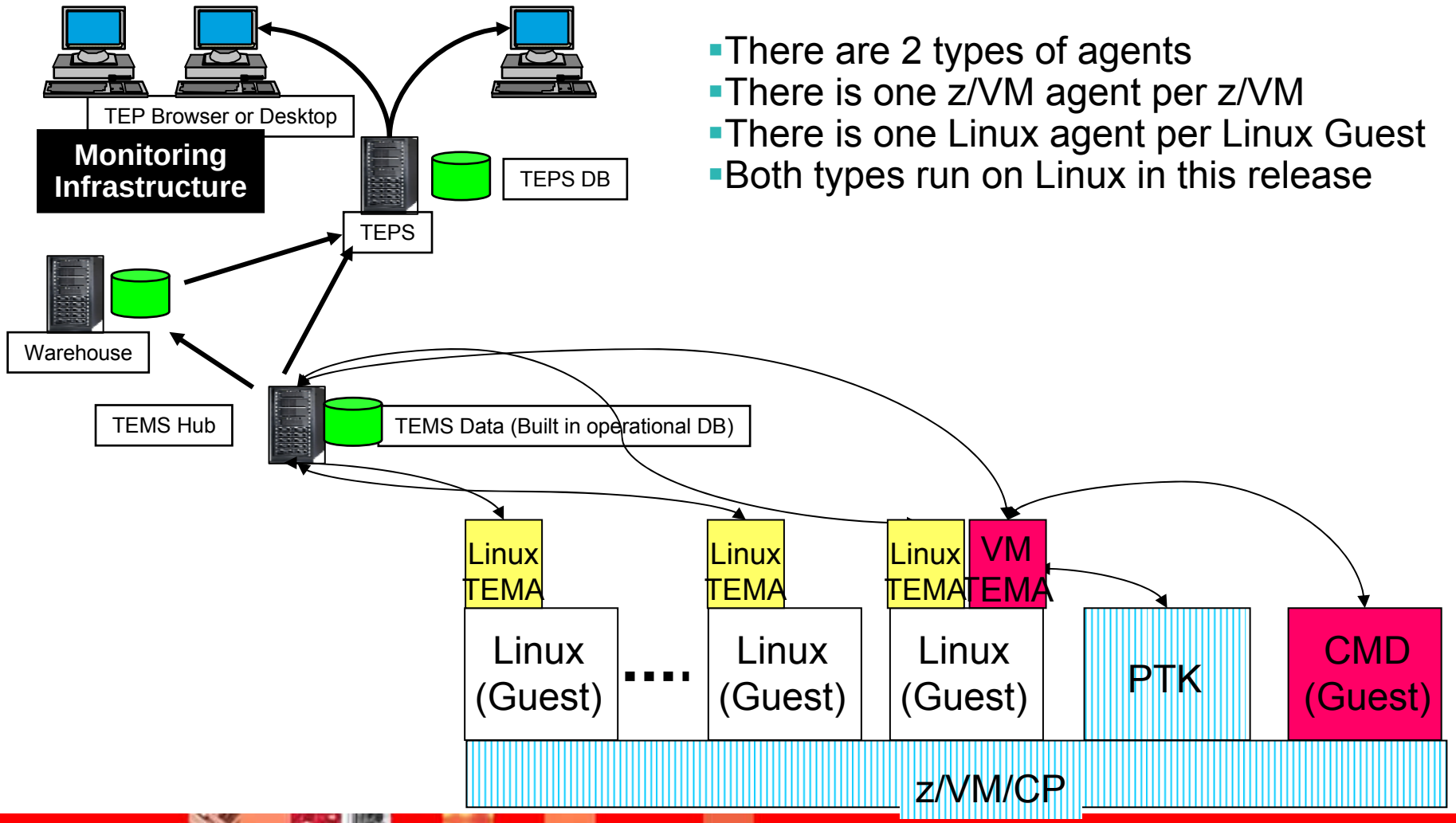
OMEGAMON XE on z/VM and Linux agents



- There are 2 types of agents
- There is one z/VM agent per z/VM
- There is one Linux agent per Linux Guest
- Both types run on Linux in this release

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Tivoli OMEGAMON XE on z/VM and Linux

Release Timeline

- OMEGAMON for VM v630 released 1Q04
- Next major release in 2006

Platform Support

- Current product: z/VM Versions 3.1.0, 4.3.0, 4.4.0 (in either 31-bit or 64-bit images), 5.1.0 or 5.2.0
- Next release: z/VM v5.2, SLES 9 for S/390 and zSeries initially. Others as function is available.

New Features in Last Major Release

- Scan key metrics and compare results with baseline thresholds
- View workloads for virtual machines, groups, response times and LPAR reporting
- Historical reporting and trending analysis
- Bottleneck Analysis

Key Features in Current Release

- Single product offering for Linux on zSeries and z/VM
- Integrated OMEGAMON XE operations console for z/VM

Software Pre-requisites

- z/VM 5.2
- Performance Toolkit 5.2
- SLES 9 with DCSS support

* Subject to change by IBM without notice.

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Tivoli OMEGAMON XE on z/VM and Linux - a Scenario

Problem

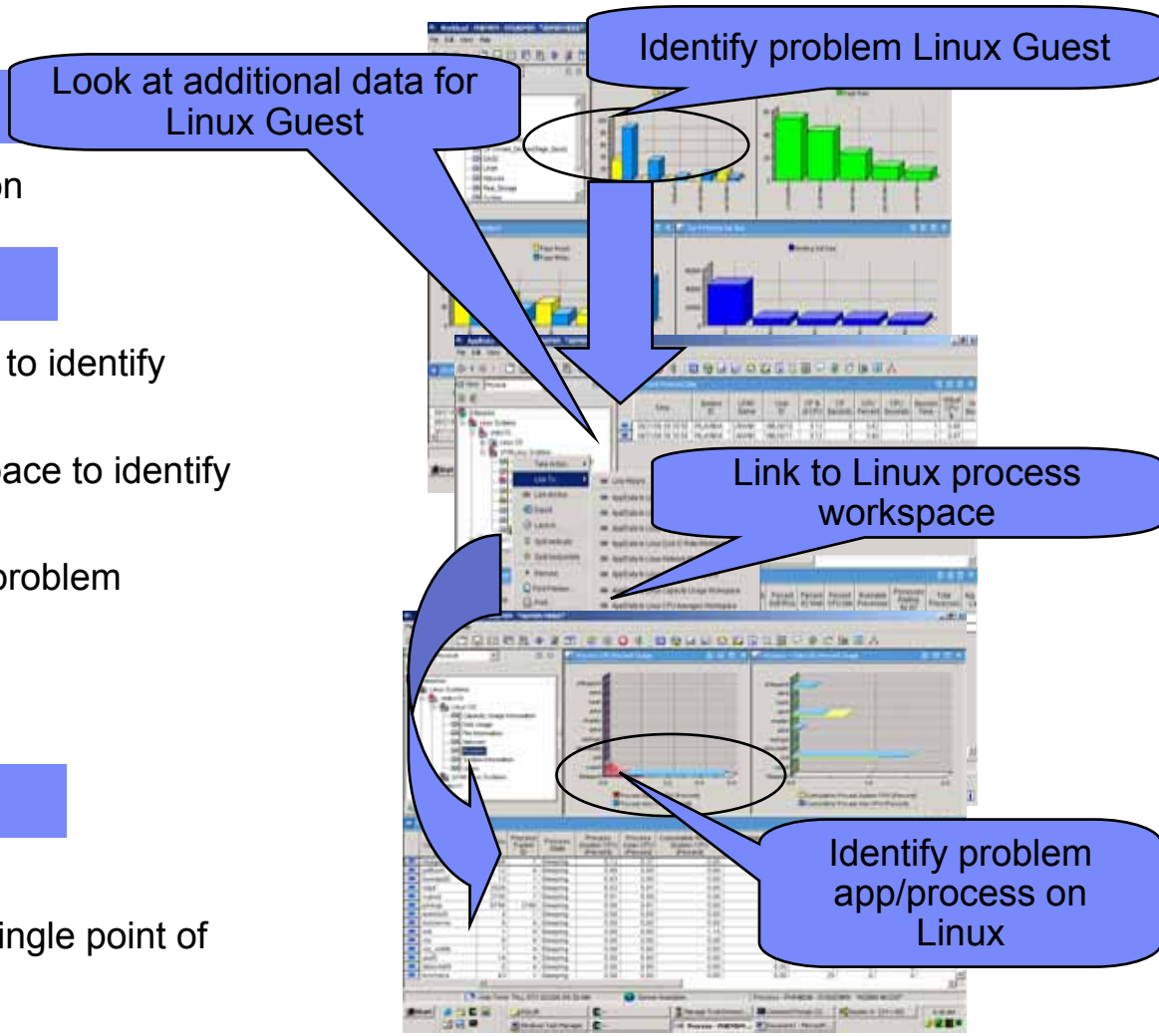
- Uneven Linux Guest CPU consumption

Solution

- Use Linux Guest Workload workspace to identify problem Linux guest
- Link to Linux workload/process workspace to identify problem app/process
- Notify app owner of app performance problem

Potential Benefits

- Quicker identification of base problem
- Can manage z/VM and Linux from a single point of control



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Tivoli OMEGAMON XE on z/VM and Linux a Scenario

Problem

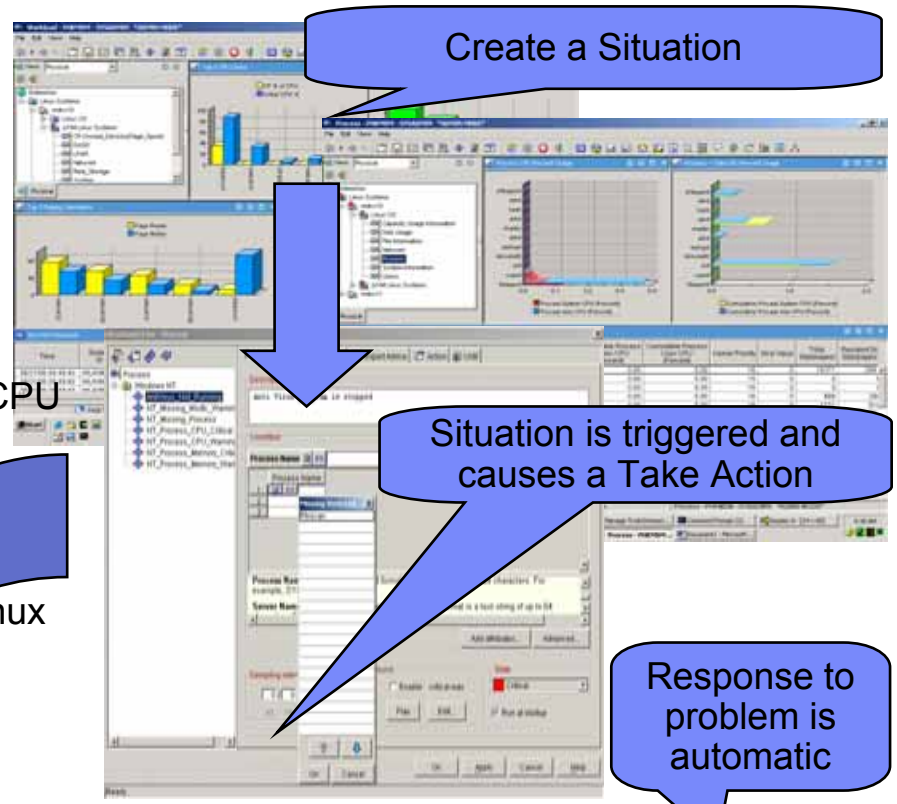
- Uneven Linux Guest CPU consumption

Solution

- Use situation to recognize high swapping with high CPU and working set size
- Send message to Operations Manager
- Operations Manager invokes a rule to execute a CP tuning command to allocate more resource to the Linux Guest

Potential Benefits

- Automated problem resolution
- Integrated solution



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Tivoli OMEGAMON XE on z/VM and Linux
An integrated approach

Environment

- Browser based user interface
- A SOA application running on WAS
- DB backend
- WAS running on Linux
- Linux running on z/VM

Symptom

- Slow application GUI response

Needs

- Top to Bottom and End to End information
  - Application on SOA on WAS on Linux on z/VM
  - Browser to Firewall to Load Balancer to Router to Application to Back End DB and back
- Easy way to hand off information across team/specialty boundaries

An Infrastructure

- This product is part of a larger suite
- Linkages, situations and policies can be developed across apps and teams to address common problems/scenarios
- Common look and feel and data handling enables problem sharing
- Generates common events/alerts
- Uses common db interface
- Toolkit available for integrating other apps or tools

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z/VM Workspaces

- **z/VM Linux Default Workspace**
- **PAGING and SPOOLING Utilization**
- **DASD**
- **LPAR Utilization**
- **NETWORK Utilization (Hiper Socket and Virtual Switch)**
- **REAL STORAGE Utilization**
- **TCPIP Utilization – Server**
- **TCPIP Utilization - Users**
- **SYSTEM Utilization**
- **System Terminal Workspace**
- **Workload (z/VM User ID) Activity**
- **Linux Workload Workspace**
- **ApplData Workspace**

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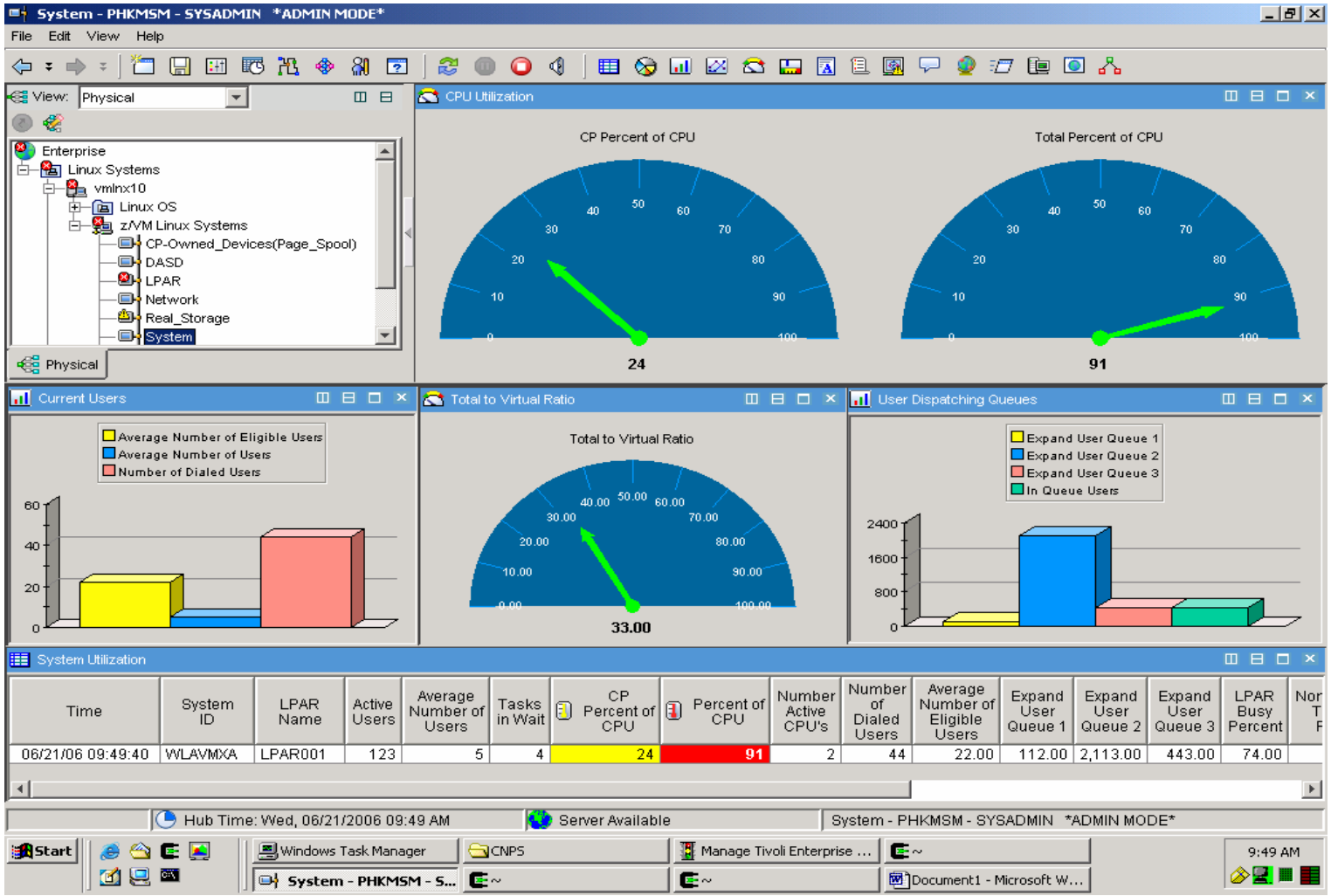
SYSTEM Utilization



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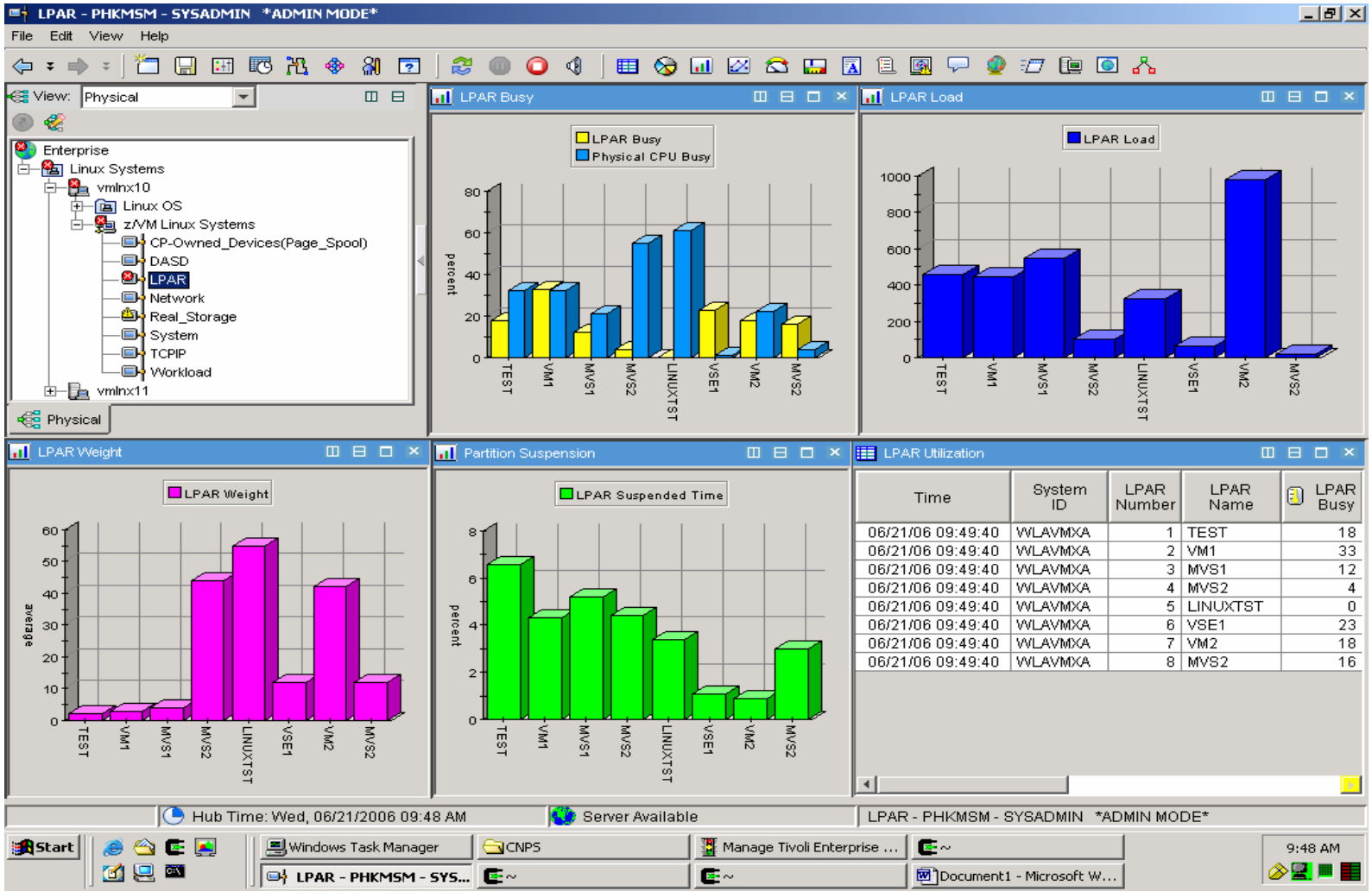
LPAR Utilization



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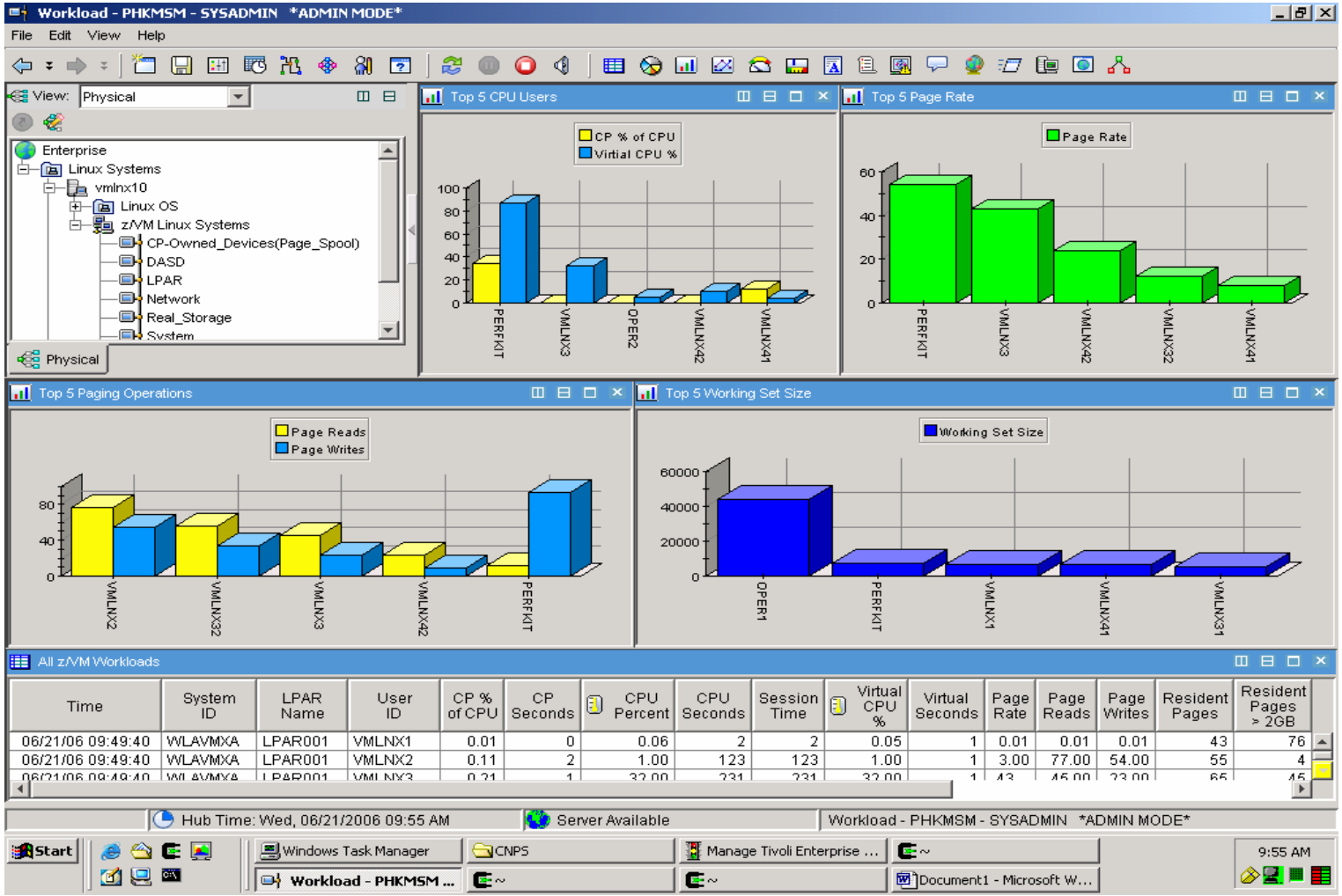
WORKLOAD (z/VM User ID) Activity



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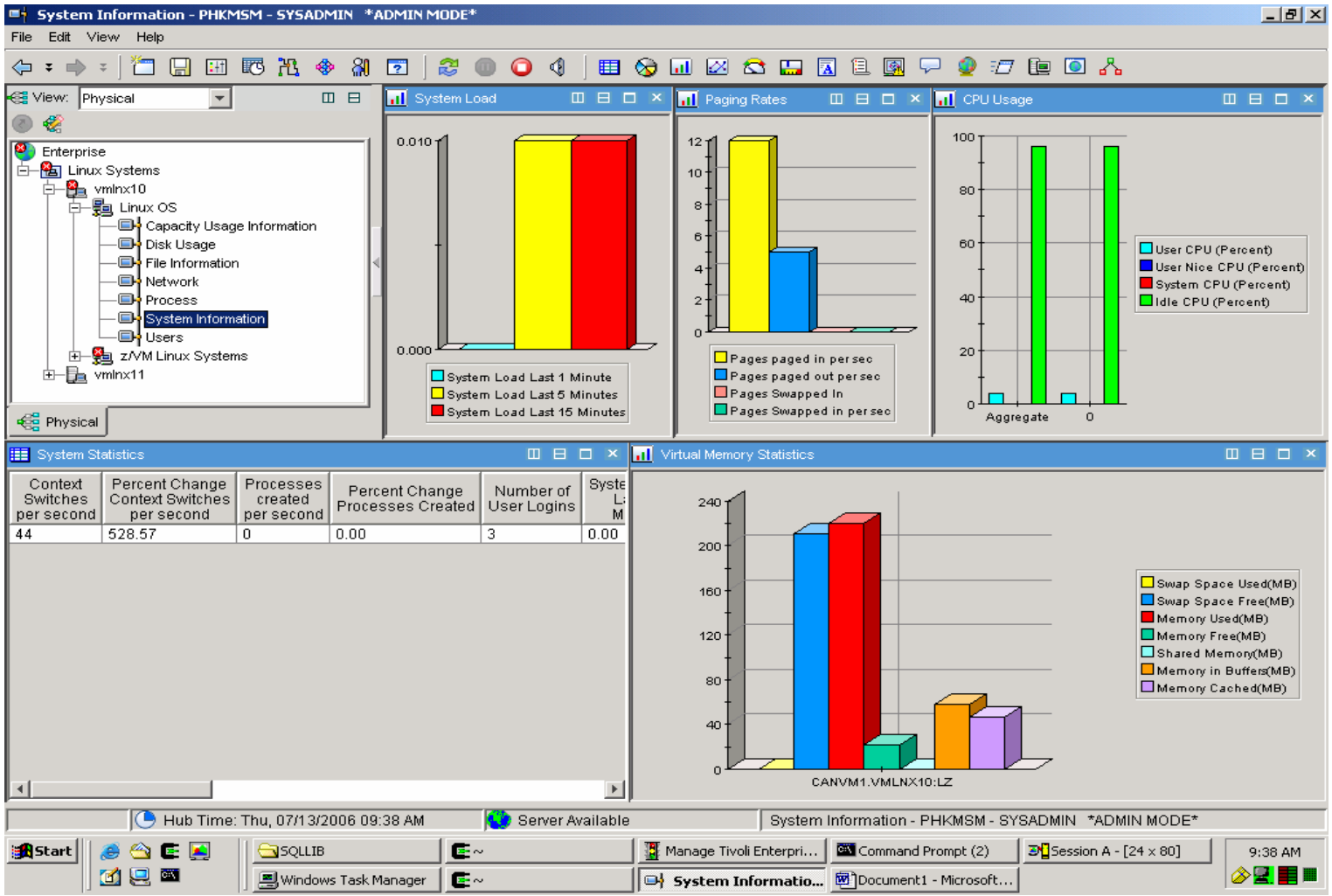
System Information



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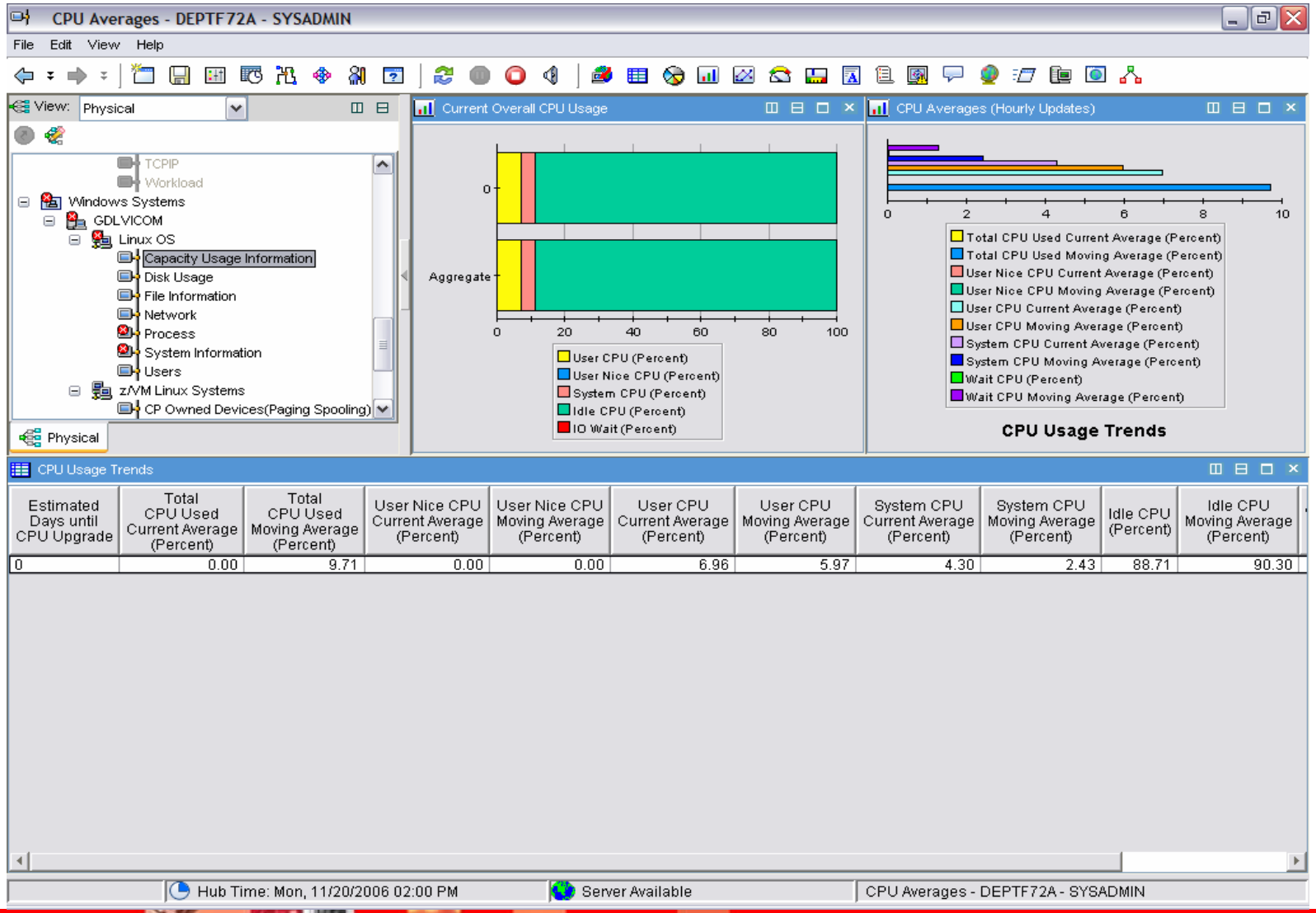
CPU Averages



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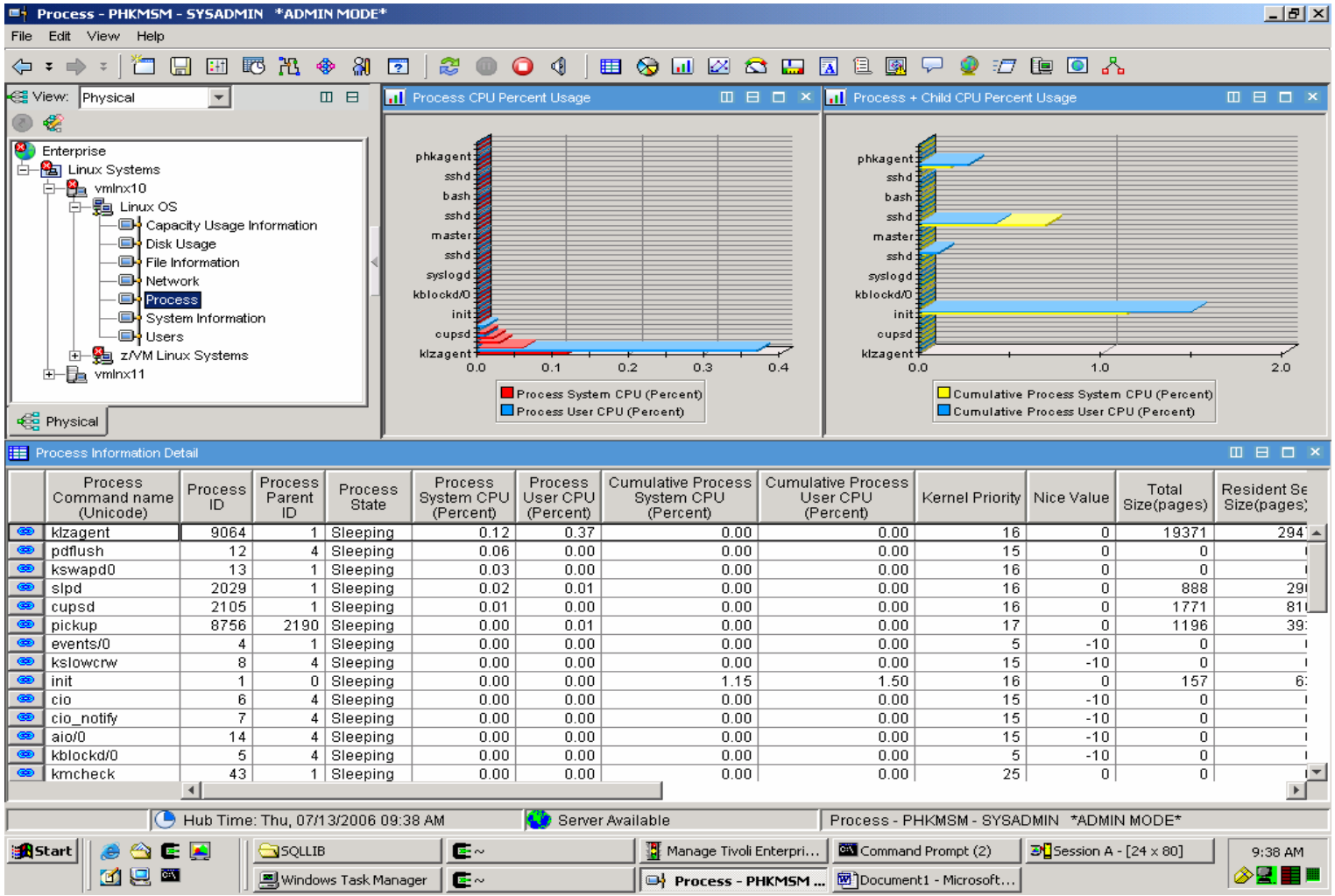
Process



Process Command name (Unicode)	Process ID	Process Parent ID	Process State	Process System CPU (Percent)	Process User CPU (Percent)	Cumulative Process System CPU (Percent)	Cumulative Process User CPU (Percent)	Kernel Priority	Nice Value	Total Size(pages)	Resident Se Size(pages)
klzagent	9064	1	Sleeping	0.12	0.37	0.00	0.00	16	0	19371	294
pdflush	12	4	Sleeping	0.06	0.00	0.00	0.00	15	0	0	
kswapd0	13	1	Sleeping	0.03	0.00	0.00	0.00	16	0	0	
slpd	2029	1	Sleeping	0.02	0.01	0.00	0.00	16	0	888	29
cupsd	2105	1	Sleeping	0.01	0.00	0.00	0.00	16	0	1771	81
pickup	8756	2190	Sleeping	0.00	0.01	0.00	0.00	17	0	1196	39
events/0	4	1	Sleeping	0.00	0.00	0.00	0.00	5	-10	0	
kslowcrw	8	4	Sleeping	0.00	0.00	0.00	0.00	15	-10	0	
init	1	0	Sleeping	0.00	0.00	1.15	1.50	16	0	157	6
cio	6	4	Sleeping	0.00	0.00	0.00	0.00	15	-10	0	
cio_notify	7	4	Sleeping	0.00	0.00	0.00	0.00	15	-10	0	
aio/0	14	4	Sleeping	0.00	0.00	0.00	0.00	15	-10	0	
kblockd/0	5	4	Sleeping	0.00	0.00	0.00	0.00	5	-10	0	
kmcheck	43	1	Sleeping	0.00	0.00	0.00	0.00	25	0	0	

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Summary

- IBM had two z/VM performance monitoring tools.
- IBM is converging these with Linux for zSeries monitoring.
- The converged product is based on the Tivoli monitoring infrastructure which includes:
  - Linux and z/VM monitoring
  - Flexible, user configurable interface
  - Situations and Policies
  - Historical data warehousing – aggregation and pruning
  - 3270 based drill down supplement – z/VM Performance Toolkit
- The new product is part of an integrated monitoring suite that can provide broad performance monitoring and management to help address broader problems with a 3270 drill down capability.

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