



Preparing for Any z/OS Performance Analysis

Peter Enrico

Email: Peter.Enrico@EPStrategies.com

Enterprise Performance Strategies, Inc.

3457-53rd Avenue North, #145

Bradenton, FL 34210

<http://www.epstrategies.com>

<http://www.pivotor.com>

Voice: 813-435-2297

Mobile: 941-685-6789



z/OS Performance
Education, Software, and
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Questions?

Send email to Peter at Peter.Enrico@EPStrategies.com, or visit our website at <http://www.epstrategies.com> or <http://www.pivotor.com>.

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Abstract



- **Preparing for Any z/OS Performance Analysis**

- Are you new to performance analysis? Or maybe your manager has tasked you with a performance analysis assignment. Or maybe you just want to make sure you are prepared for any performance problem that comes your way.
- This presentation might not discuss how to do one specific performance analysis. Instead, during this presentation, Peter Enrico will discuss some very basic tasks you need to do to prepare for any performance analysis that may come your way.

EPS: We do z/OS performance...



- We love to bring you these complimentary webinars and to teach you how to do what we do!
- But remember, we would love to work with you!
 - ***Pivotor - Performance reporting and analysis of your z/OS measurements (i.e. SMF, etc.)***
 - Not just reporting, but coset effective analysis-based reporting based on our expertise
 - ***Performance Educational Workshops (while analyzing your own data)***
 - Essential z/OS Performance Tuning
 - Parallel Sysplex and z/OS Performance Tuning
 - WLM Performance and Re-evaluating Goals
 - ***Performance War Rooms***
 - Concentrated, highly productive group discussions and analysis



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The 3 Responsibilities of all Computer Performance Analysts
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This video details the three primary responsibilities of any computer performance analyst. If you someone thinking of getting into the field of computer performance analysis, of if you are an IT manager that wants to understand what your staff is doing, or many you are already a computer performance analyst and just want to hear my organization of thought on the responsibilities, then this video is for you. Also note... this was my very first YouTube video. It is rough around the edges, but READ MORE

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Like what you see?



- Free z/OS Performance Educational webinars!
 - The titles for our Fall 2020 webinars are as follows:
 - ✓ *WLM Response Time Goals Primer*
 - ✓ *Setting Response Time Goals for Modern Applications*
 - ✓ *Evaluating Latent Demand in the Mainframe Environment*
 - ✓ *Adjusting WLM Settings for Latent Demand*
 - ✓ *Improving Performance with Multiple Period Service Classes*
 - ✓ *Preparing for Any z/OS Performance Analysis*
 - *Evaluating Coupling Facility Lock Structures*
 - ~~*Exploring Coupling Facility Exploitation by VSAM RLS*~~
 - *Data in Memory (DIM) Primer*
 - *Counting Instructions: Valuable Insights or More Noise?*
 - Let me know if you want to be on our mailing list for these webinars
- If you want a free cursory review of your environment, let us know!
 - We're always happy to process a day's worth of data and show you the results
 - See also: <http://pivotor.com/cursoryReview.html>

Prepping for an Analysis

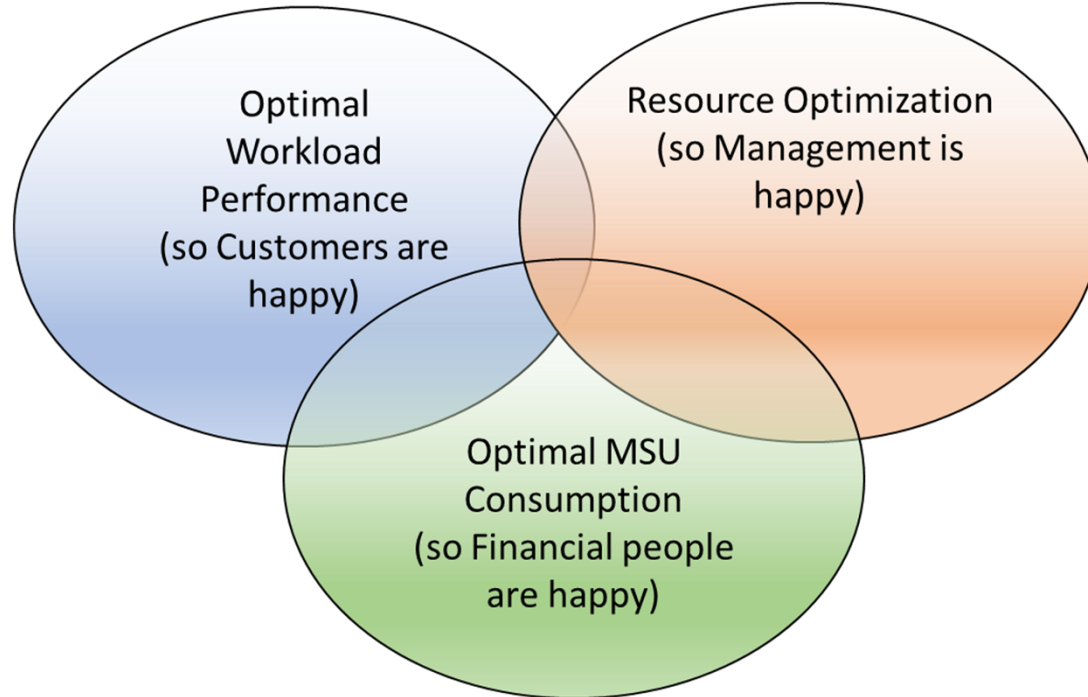


- The question is, where do you start?
 - Regardless of the analysis, the pre analysis tasks are the same regardless the subject of the analysis
- Say an analysis needs to be done, but you are not sure how to start:
 - **Newbie**
 - You are a zNextgen professional new to the Z platform
 - **Seasoned z/OS professional**
 - You are an experienced z/OS professional, but performance is not your strong suit
 - **z/OS performance pro**
 - You are a z/OS performance professional

The Performance Balancing Act



- Performance on z/OS is about finding an optimal balance among 3 areas
 - Typically, performance analysis has these objectives



Performance Analysis Timeline



- While every performance analysis is different...

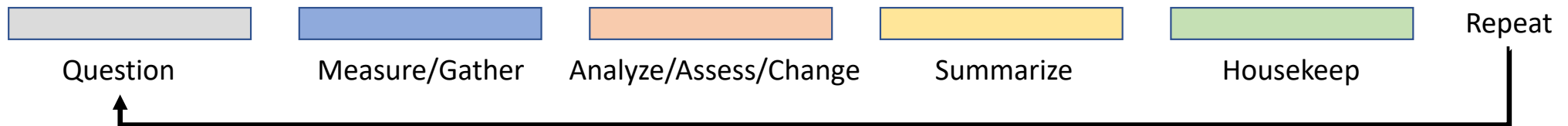
- Immediate performance debug
- Longer term performance analysis
- Performance health check
- Capacity planning
- Management questions
- MSU reduction exercises
- Etc...

Much needs to be done just to prepare for a performance analysis

- Remember it is continuous
- Never expect to know all

- ... the timeline is fairly simple with prepping being longest and continuous

Preparing / Learning must continuously be done in addition to the below



Remember...



- Performance is a combination of:
 - Hardware capabilities and capacities
 - System Software and products configuration
 - Application design & implementation
 - ... and... unfortunately, software pricing agreements
- Of these, System Software Configuration is often the easiest/cheapest to change
 - Hardware capability is set once you decide what type of hardware to purchase
 - Capacity can be extended at a cost
 - Application design is inexpensive to influence when it's being set, but very expensive once the application is implemented



Continuous Tasks to Learn and Prepare For Any Analysis

Note: This subject is enormous!

Purpose of this presentation is to give some organization to thought.

Make friends, meet mentors, be a mentor



- Chances are there are others that already know what you want to learn
- Get to know who to talk with
 - Chances are they already have an idea where you need to concentrate your efforts
 - Examples:
 - If you are not the db2 person, you should find the db2 person
 - Who are the application developers?
 - Who is your sales rep?
 - Etc...
- Good colleagues will know a bunch!
 - **Great colleagues will openly and readily share the information!**
- And if there is no one?
 - The become that person!
- Also think about becoming a mentor for the new folks

Determine who your customers are



- Know your customers and their performance sensitivity points
 - Who are your customers?
 - Customer service level objectives
 - Performance expectations
 - What workload and transactions are service each customer group

- There are many groups of customers
 - Customers that are end-users outside your company
 - Your system programmer colleagues
 - Your management
 - The helpdesk
 - The financial groups
 - Whomever is using your computing environment

Inventory Your Managed Resources



- The physical resources have huge implications and capacity
- Eventually, everything runs here
 - Processors
 - Storage controllers
 - Tape controllers
 - I/O cards, zEDC, cards, OSA cards, crypto cards, e'
 - Links and channels

Processors



Storage Controllers



- Learn the details, and if possible, the performance characteristics of each
 - Not just what is there, but also the capacities and capabilities of areas that impact the areas of your analysis
 - Example: Types and capacity of processors
 - Example: How much storage? How does it work?
 - Who are the vendors?

VTS Devices

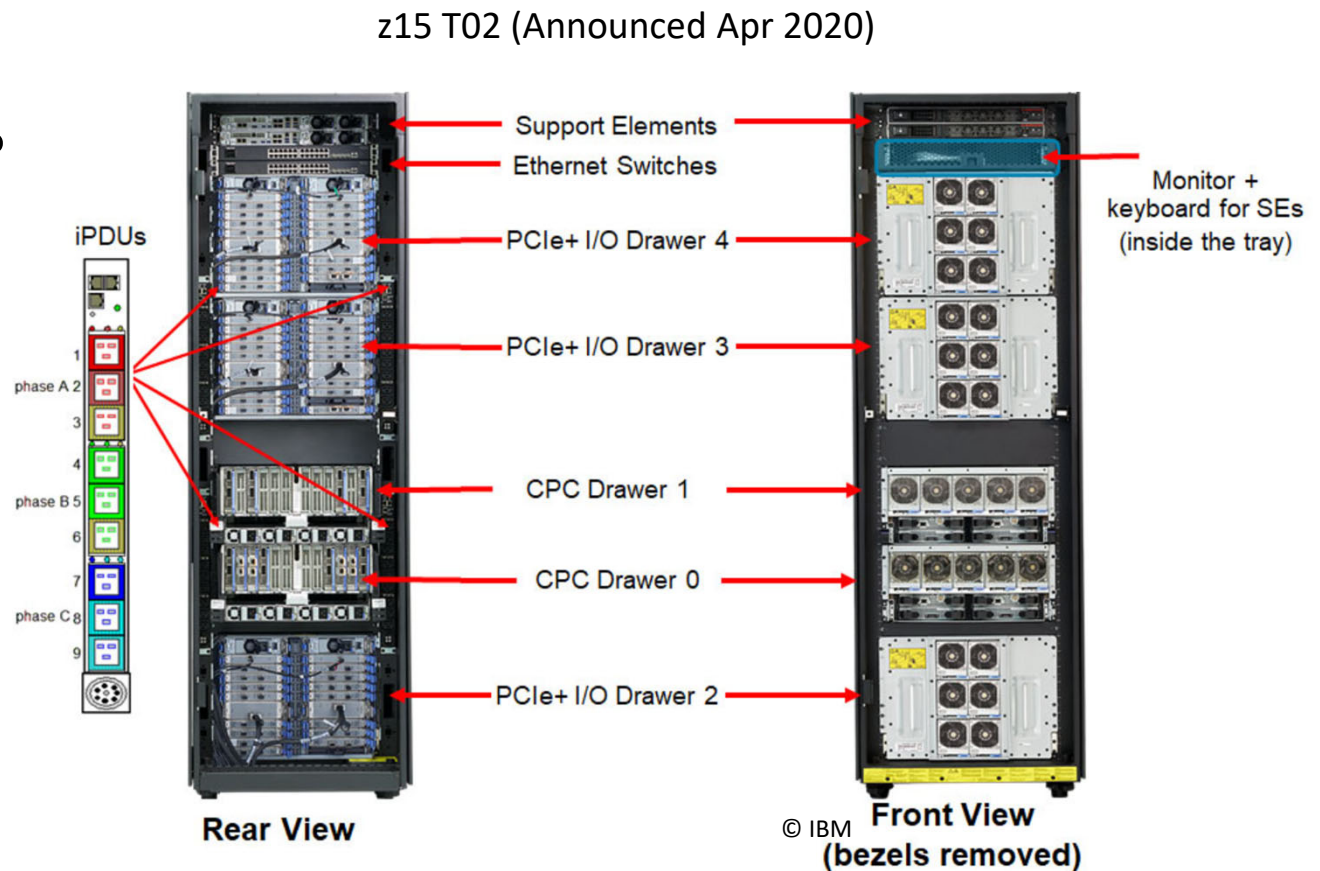


Lots of cards and adapters

Learn about the machines



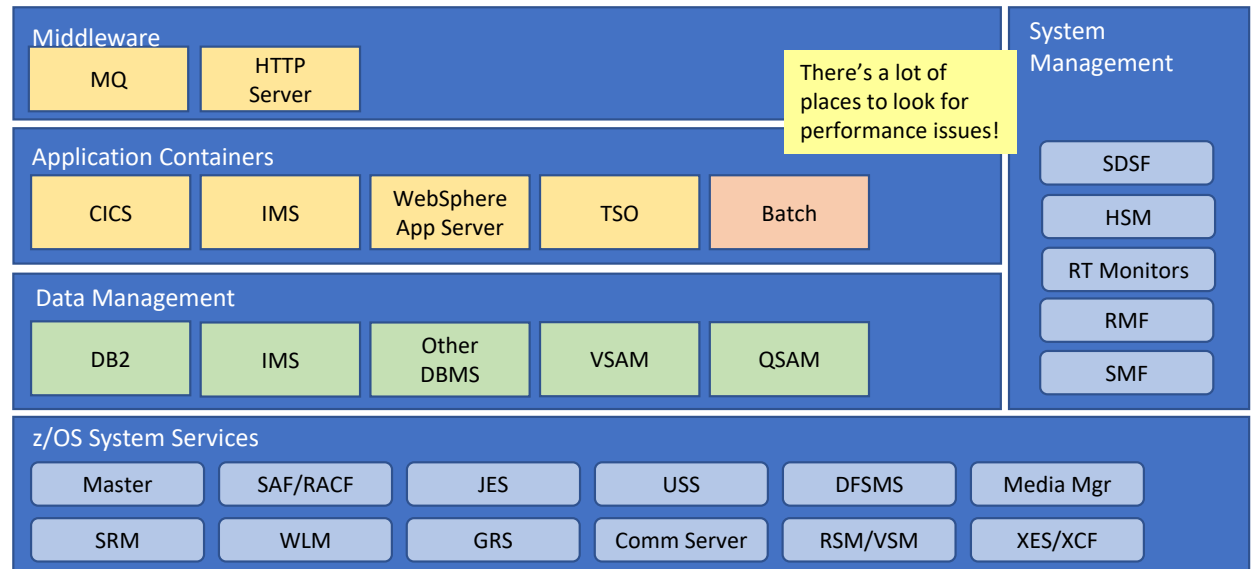
- Open up your machines
 - Get familiar with them
 - What is behind the doors?
 - How does A connect with B
 - Have your vendor give you a tour, or just take the product doc and learn as you look



Inventory your software stack



- Installed software and products huge implications to performance and capacity
 - System software stack
 - Application and transaction management products
 - Database management products
 - Systems management products
 - Monitors
- Software products, levels, and choices impact performance, and factors into tuning and capacity decisions
 - Product levels
 - Product dependencies
 - How the products interact

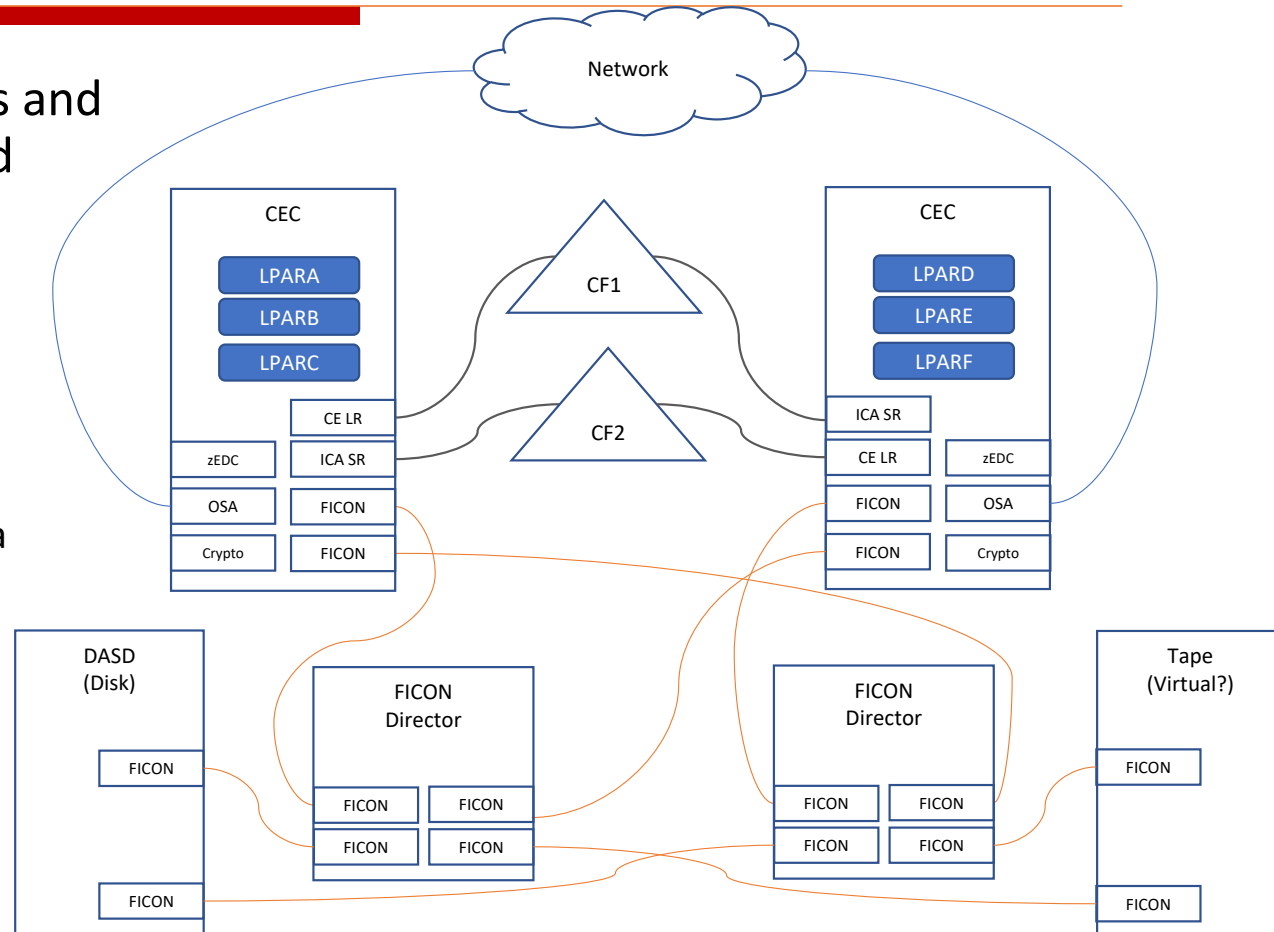


Understand the system and Sysplex configurations



- Learn how the physical resources and software stacks are all configured and put together to create your working environment

- Understand how the hardware is connected
- Understand how the software in associated with hardware
- Understand system, Sysplex and data sharing configurations

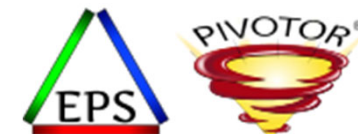


Understand the system and Sysplex configurations



- Also make sure you ask why the configuration exists as it does
 - Every system has configuration details, a purpose, a priority, etc.
 - Every Sysplex and Monoplex have configuration details, a purpose and priority
 - Why are things setup the way they are?
- Of course, there are disaster recovery configurations and details
 - What is the DR configuration
 - How does the DR work?
 - What type mirroring is involved
 - Etc.
- Note: Most installations maintain amazing configuration summary spreadsheets and mappings
 - Tap into these spreadsheets, presentations, and documents
 - But if your installations lacks such formal documentation, then documenting is an amazing learning experience

Use measurements to learn configuration



- Many standard measurement reports will help surface configuration details
 - Example: Processor: SMF 70, SMF 113

P A R T I T I O N D A T A R E P O R T															
z/OS V2R2				SYSTEM ID SYSP				DATE 01/24/2019				INTERVAL 14.59.975			
				RPT VERSION V2R2 RMF				TIME 05.45.00				CYCLE 1.000 SECONDS			
MVS PARTITION NAME		PROD01		PHYS PROC NUM		4		GROUP NAME		MSUCAP		INITIAL CAP		NO	
IMAGE CAPACITY		225		CP		2		LIMIT		225		LPAR HW CAP		NO	
NUMBER OF CONFIGURED PARTITIONS		9		ICF		1		AVAILABLE		-14		HW GROUP CAP		NO	
WAIT COMPLETION		NO		IIP		1						ABS MSU CAP		NO	
DISPATCH INTERVAL		DYNAMIC													

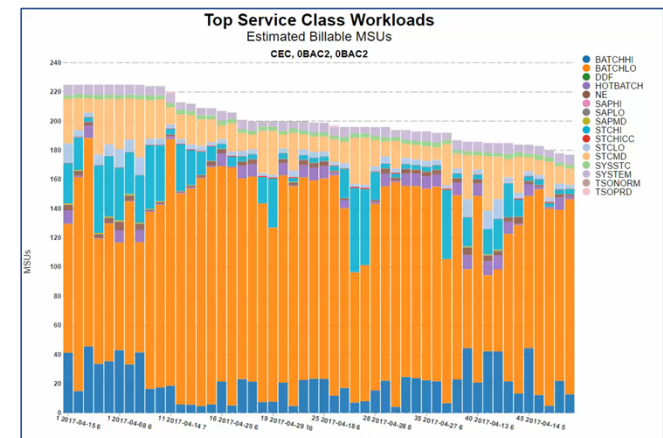
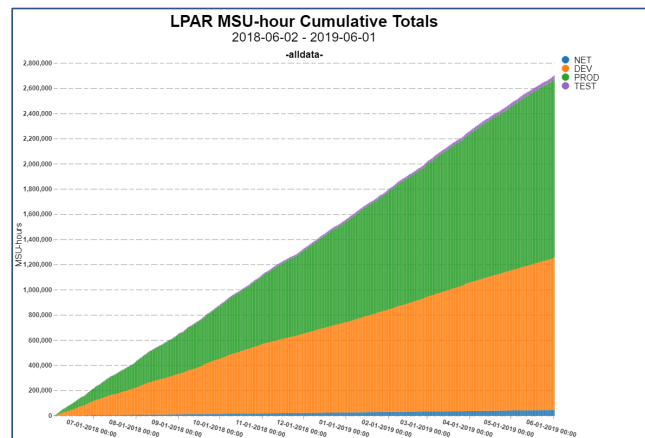
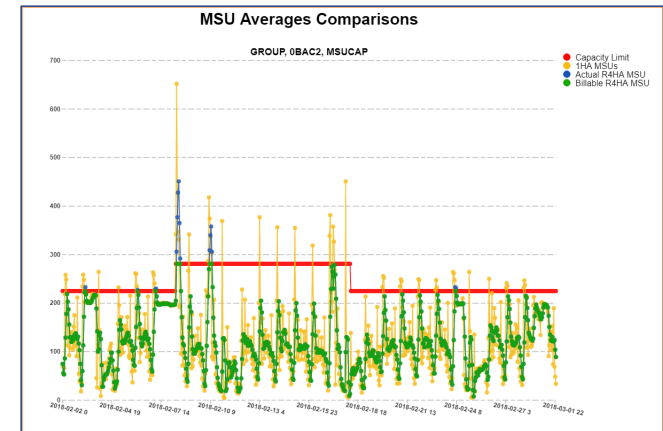
PARTITION DATA								LOGICAL		PARTITION PROCESSOR DATA				AVERAGE PROCESSOR UTILIZATION PERCENTAGES					
-----MSU-----								--CAPPING--		--PROCESSOR		----DISPATCH TIME DATA----				LOGICAL PROCESSORS		--- PHYSICAL PROCESSORS ---	
NAME	S	WGT	DEF	ACT	DEF	WLM%	NUM	TYPE	EFFECTIVE	TOTAL	EFFECTIVE	TOTAL	LPAR	MGMT	EFFECTIVE	TOTAL			
PROD01	A	85	0	200	N N N	100.0	2	CP	00.21.18.778	00.21.19.170	71.05	71.07	0.02		71.05	71.07			
DEVL01	A	13	0	27	N N N	97.1	2	CP	00.02.52.314	00.02.52.760	9.57	9.60	0.02		9.57	9.60			
ICFD01	A	5	0	1	N N N	0.0	1	CP	00.00.04.001	00.00.04.231	0.44	0.47	0.01		0.22	0.24			
ICFT01	A	5	0	1	N N N	0.0	1	CP	00.00.03.775	00.00.04.002	0.42	0.44	0.01		0.21	0.22			
TEST01	A	2	0	4	N N N	100.0	2.0	CP	00.00.22.064	00.00.22.571	1.23	1.25	0.03		1.23	1.25			
PHYSICAL										00.00.05.973				0.20		0.33			
-----										-----				-----		-----			
TOTAL		110							00.24.40.934	00.24.48.708			0.30		82.28	82.71			
ICFP01	A	DED					1	ICF	00.14.58.059	00.14.58.065	99.79	99.79	0.00		99.79	99.79			
PHYSICAL										00.00.01.870				0.00		0.21			
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TOTAL		0							00.14.58.059	00.14.59.936			0.01		99.79	100.0			

Understand pricing and software billing



- What are your pricing agreements?
 - MLC?, TFP?, etc.
 - Separate development env agreements?
 - Do you have software products that control or influence this?
- Unfortunately, software pricing controls are a nutty pairing with performance

- What are the imposed pricing constraints?



Inventory and understand the workloads



- The workloads are what give the resources and software purpose
 - This is different than understanding your software stack
- Your workloads have many pieces
 - Transaction and communication manager workloads
 - CICS, IMS, WAS, SAP, etc...
 - Database management workload
 - DB2, VSAM, IMS/DB, IDMS, Adabase, etc
 - Batch
 - Daytime, adhoc, nighttime, development
 - Interactive workloads
 - TSO, USS
 - Distributed and e-commerce workloads
 - DDF, HTTP, etc.
 - System and system programmer maintenance workloads

There is so much to learn about the workloads

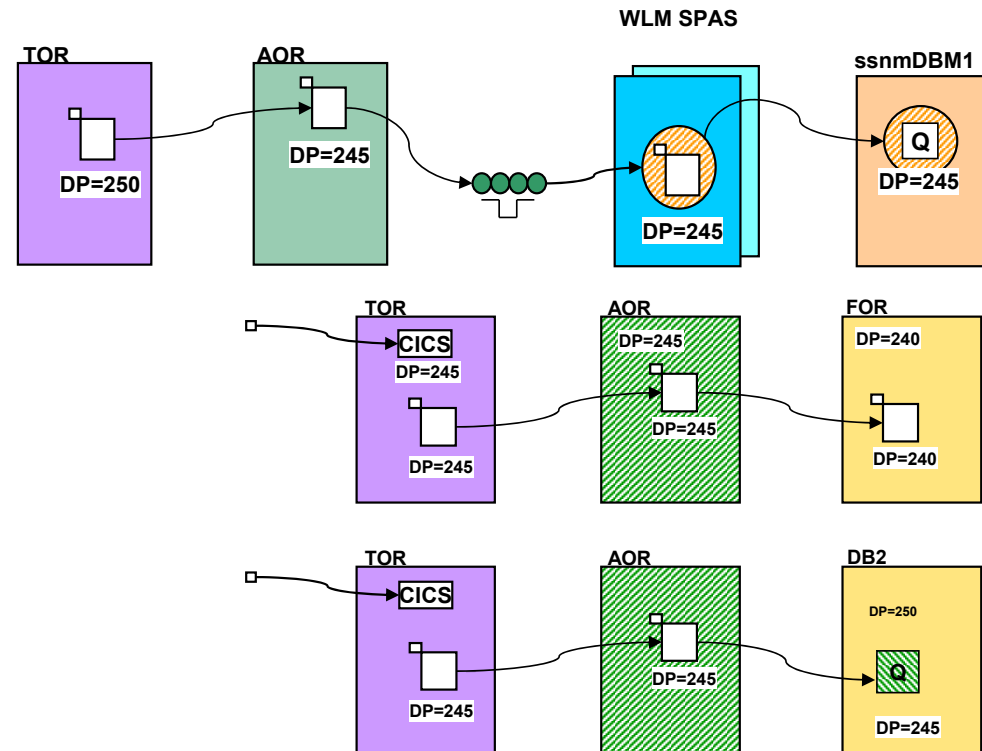
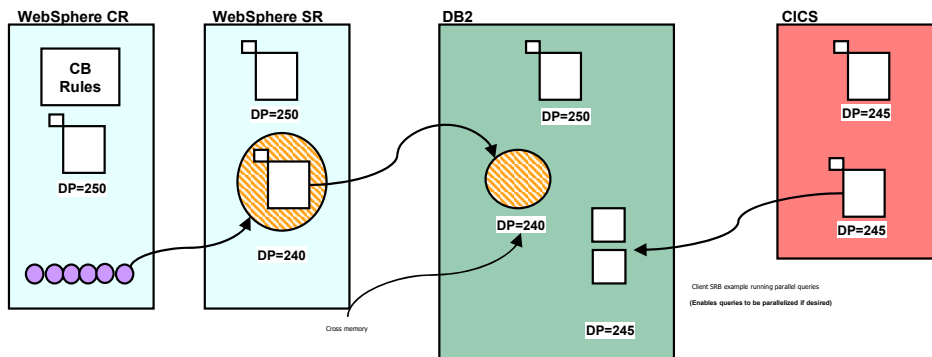


- Look at the workloads from a 'physical' point-of view
 - Address spaces or enclaves or flowing transactions?
 - Are the address spaces servers or workers or system or... ?
 - Are the transactions managed by WLM?
 - What are the objectives and importance of the workloads?
- Look at the workloads from business point of view
 - Production workloads
 - Development, Test, Sandbox workloads
 - System programmer
 - E-commerce workloads (24 hours a day)
 - Month-end, quarter-end, year-end workloads
 - Seasonal workloads
 - Disaster recovery

Learn about the application and transaction flows



- The applications and the transaction flows are at the heart of most performance concerns
 - Home grown or vendor product?
 - How are they deployed?
 - How do they work?
 - How are they measured?
 - Anything you can learn!



Learn about the application and transaction flows



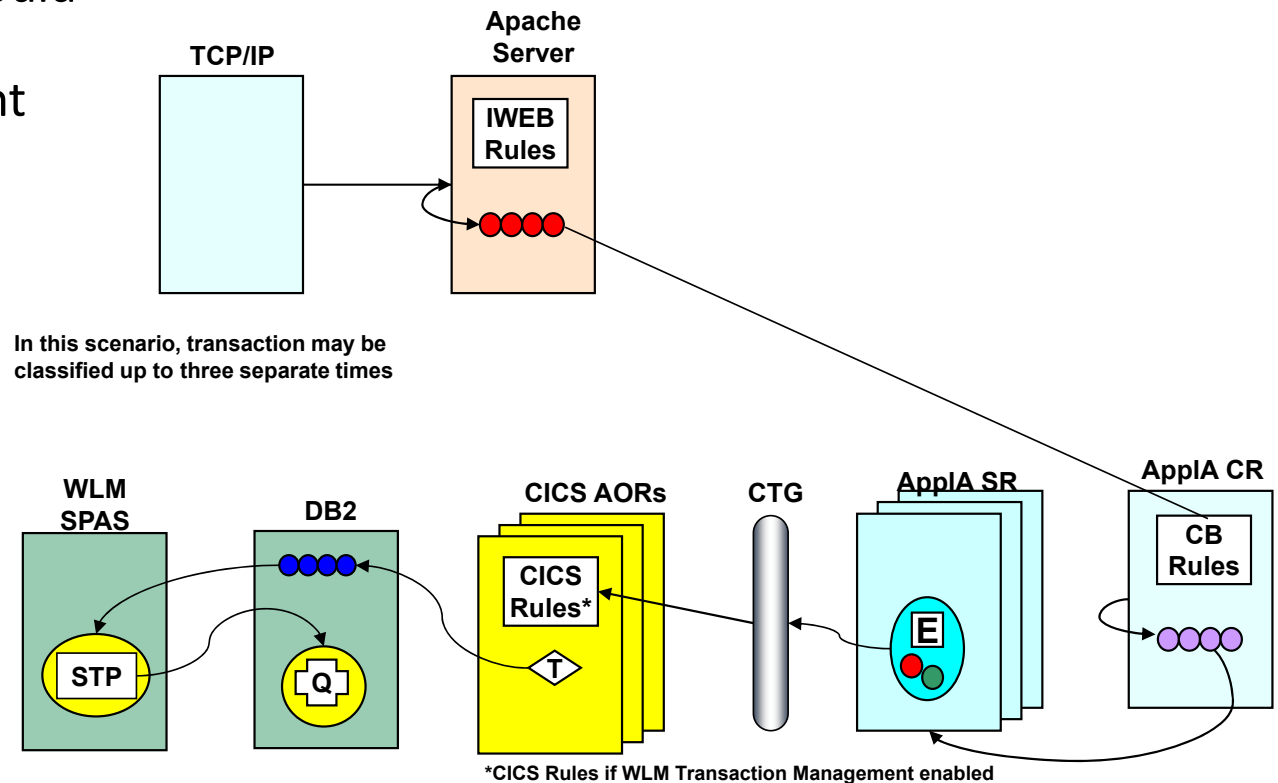
- Remember the flows can be complex

- Measurement and tuning could be dependent upon the architecture and deployment

- What products are involved in the flow of the application?

- Who suffers and benefits?

- When does the application run and matter?



Remember there are always business parameters



- Understand and consider the non-functional parameters and restrictions that might affect performance and how you do your job
- Example
 - Maybe the reason a performance problem exists is because there is not enough processor capacity.
 - And management has said they cannot upgrade to a new processors this year
 - Thus, you will need to work within the guidelines of this restriction
- Other things to consider
 - Regulatory constraints
 - Cost constraints
 - Outsourcing constraints
 - Licensing constraints

Or course, inventory and understand parameters and controls



- Learn the rules, guidelines, and parameters that control the environment
 - Parmlib members
 - WLM service definition
 - Couple datasets (look at the JCL that created)
 - License agreements
- Each subsystem and product usually have its own set of parameters
 - WAS – Administration panels
 - DB2 zPARM
 - CICS parms
 - IMS parms
 - Any vendor product and their parms
- Even your applications have parameters
 - Talk with your developers and vendors

Summary Performance Analysis Timeline



- While every performance analysis is different...

- Immediate performance debug
- Longer term performance analysis
- Performance health check
- Capacity planning
- Management questions
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- Etc...

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