Modern z/OS Performance Reporting: The Pivotor Difference

z/OS Performance
Education, Software, and
Managed Service Providers

Creators of Pivotor®

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Agenda

- Who we are
- What we do
- How and why Pivotor is different from most other performance reporting tools in the market
- Demo

Enterprise Performance Strategies, Inc.

- Peter Enrico founded EPS after leaving IBM in the late 90s
  - He helped write WLM, worked on RMF, did many other performance things
  - Founded EPS to focus on mainframe performance
  - Genesis of Pivotor goes back to about 2004
- Scott Chapman joined up with Peter in 2014
  - He was the mainframe performance and capacity guy for mid-sized shop
  - Had been a Pivotor customer for a couple of years
  - Wanted to drive Pivotor and mainframe performance reporting forward
- Operational provided excellence by...
  - Dana, Lizann, Jamie, Nancy, and Pim

EPS: We do z/OS performance…

- Performance Reporting (with Pivotor)
  - Performance reporting and analysis of your z/OS measurements
    - Example: SMF, DCOLLECT, other, etc.
  - Not just reporting, but cost-effective analysis-based reporting based on our expertise
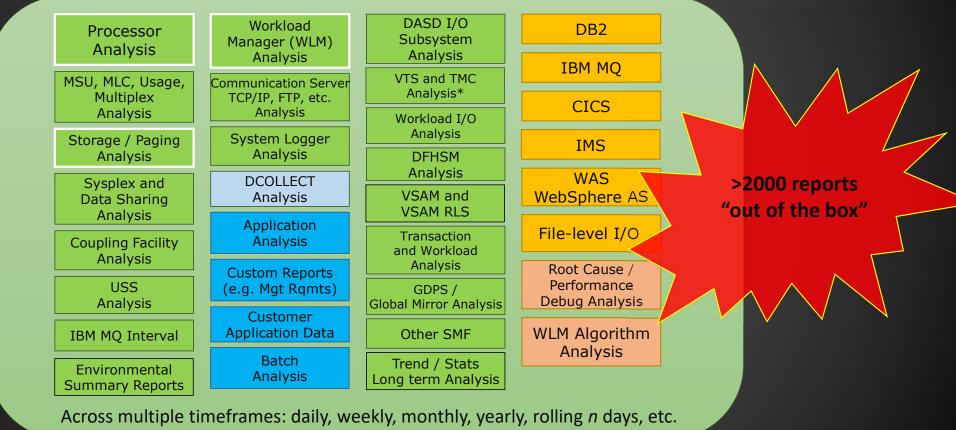
- Performance Educational Workshops (while analyzing your own data)
  - Essential z/OS Performance Tuning
  - Parallel Sysplex and z/OS Performance Tuning
  - WLM Performance and Re-evaluating Goals

- Performance War Rooms
  - Concentrated, highly productive group discussions and analysis

- Pivotor is our data reporting tool & service designed specifically for z/OS performance reporting

  - Designed and used by z/OS performance experts
  - Processes data from SMF, DCOLLECT, and customer sources
  - Contains hundreds of z/OS performance reports "out of the box"

Comprehensive Report Sets
for Immediate Performance Analysis

Processor Analysis	Workload Manager (WLM) Analysis	DASD I/O Subsystem Analysis	DB2
MSU, MLC, Usage, Multiplex Analysis	Communication Server TCP/IP, FTP, etc. Analysis	VTS and TMC Analysis*	IBM MQ
Storage / Paging Analysis	System Logger Analysis	Workload I/O Analysis	CICS
Sysplex and Data Sharing Analysis	DCOLLECT Analysis	DFHSM Analysis	IMS
Coupling Facility Analysis	Application Analysis	VSAM and VSAM RLS	WAS WebSphere AS
USS Analysis	Custom Reports (e.g. Mgt Rqmts)	Transaction and Workload Analysis	File-level I/O
IBM MQ Interval	Customer Application Data	GDPS / Global Mirror Analysis	Root Cause / Performance Debug Analysis
Environmental Summary Reports	Batch Analysis	Other SMF	WLM Algorithm Analysis
		Trend / Stats Long term Analysis	

>2000 reports "out of the box"

Across multiple timeframes: daily, weekly, monthly, yearly, rolling *n* days, etc.

But how is Pivotor different?

There is a Pivotor tier for every budget

Pricing is not based on the size of your machines, but rather the data that we're processing. Upgrade all you want: we won't get in the way of your business!

PIVOTOR®

z/OS Performance reporting that fits every need and budget

	Cloud			On-Site
	FREE	Essentials	Prime	Enterprise
Major Reporting Areas				
Basic LPAR, service/report classes	✓	✓	✓	✓
Batch		✓	✓	✓
I/O subsystem & channels			✓	✓
Sysplex, XCF, System Logger			✓	✓
Sub-minute performance (SMF 98/99)			✓	✓
DCOLLECT			✓	✓
TCP/IP (SMF 119)			✓	✓
Hardware Instrumentation (SMF 113)		✓	✓	✓
Dataset I/O Details (SMF 14/15, 42)			Optional	✓
CICS, WAS			Optional	✓
DB2, IMS*			Optional	✓
Custom data sources			✓	✓
Application attribution			✓	✓
Other supported SMF records			✓	✓
Report Retention				
Daily report retention	7 days	2 years*	2 years*	Up to you
Weekly/Monthly/Yearly report retention		Unlimited*	Unlimited*	Up to you

Performance Assistance and Education				
EPS available to answer performance questions with your data	Limited	✓	✓	Limited
Annual review calls			✓	
Playlist-guided analysis	✓	✓	✓	✓
In-depth Report Help	✓	✓	✓	✓
Exceptions	✓	✓	✓	✓
Dashboards			✓	✓
Other				
Least effort: just send us data!	✓	✓	✓	
Complete control & database access				✓
Cost				
Starting price (per year)	$0	$10,000	$25,000	$50,000
Pricing metric	1 system only	Report plexes + systems + RMF interval	Report plexes + systems + RMF interval	CECs + z/OS LPARs

EPS — Excellence in Mainframe Performance

www.epstrategies.com
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* while service subscription maintained

Cloud first

- Although Pivotor can be installed on-site, it is primarily offered as a "cloud" solution
    - A very secure cloud (more on this later)
- This *greatly* simplifies z/OS performance reporting
    - Just (S)FTP(S) us the data, we take care of the rest (we're good at it!)
    - No infrastructure to buy and maintain
    - No specialized knowledge to maintain the performance reporting
        - No domain-specific languages

Local install flexibility

- Where a local install is appropriate, there's a great deal of flexibility
- Need to be able to run Java 8
- Need a relational database with a JDBC driver
    - This database agnostic approach is quite unique
    - Naturally, some databases do work better than others

- FYI: local install probably only makes good sense for the very largest environments or where there's very stringent restrictions on sending out data

Concentrate on performance, not reporting

- Spending time investigating and understanding the performance of your systems is a much higher value than understanding how to run reports!
- z/OS experts are retiring and a new generation is coming in that needs to get up to speed and Pivotor embeds z/OS performance knowledge
  - Short description available for every report, long-form help (paragraphs) for selected reports
  - Playlists walk you through an analysis
  - Exceptions help highlight areas of concern
  - Experts are only an email away

Speaking of those experts…

- Pivotor and the Pivotor reports designed by experts with decades of mainframe experience
- We actively use the product every day
  - Helping customers with their z/OS performance issues
  - Just reviewing customer data in the pursuit of new reporting, new education
  - "Off-label" use: we use Pivotor to help monitor the Pivotor service
- We're a small, privately held, US-based company
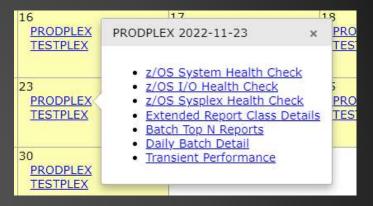 - We're easy to deal with
  - The owners are actively involved in all aspects of the business

Pivotor reporting is approachable

- Any performance investigation starts with "when"
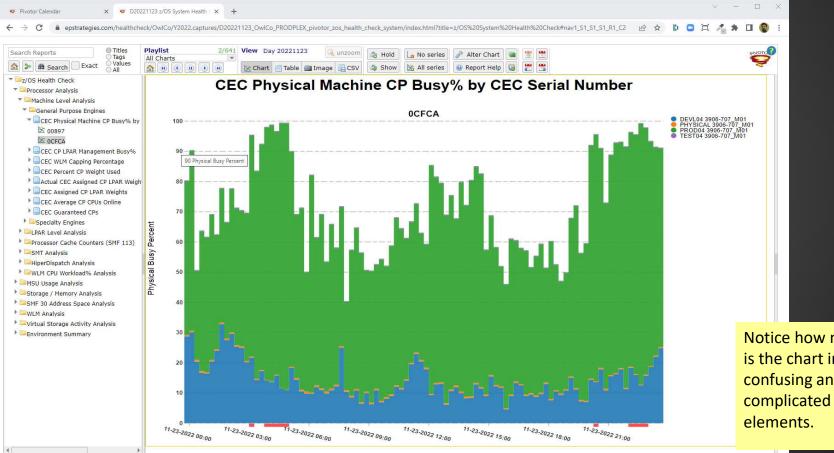- With Pivotor, performance reports are arranged in a calendar

Pivotor reporting is well-organized

- Reports are organized into Report sets
  - Report sets contain related reports
  - Search within report sets
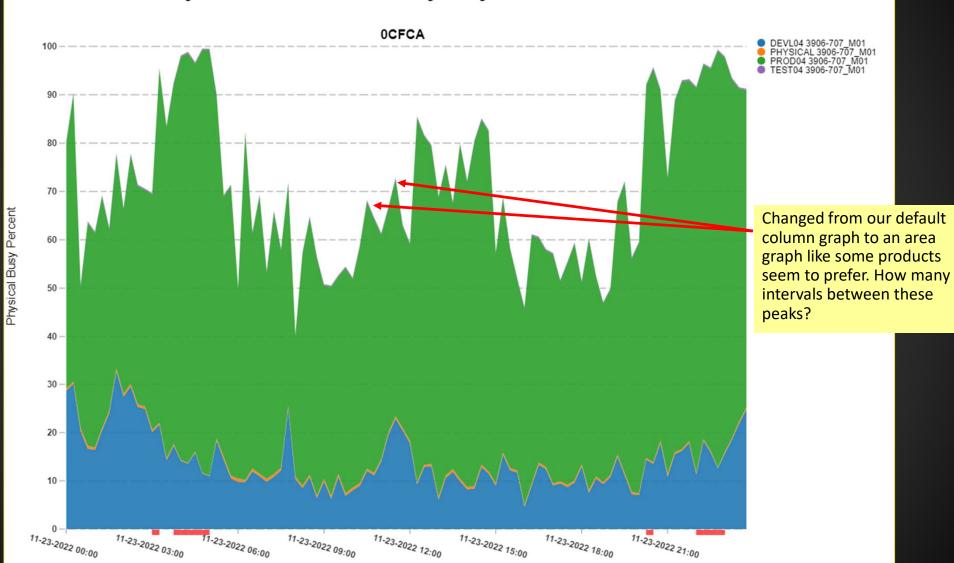- Logical organization in a report set
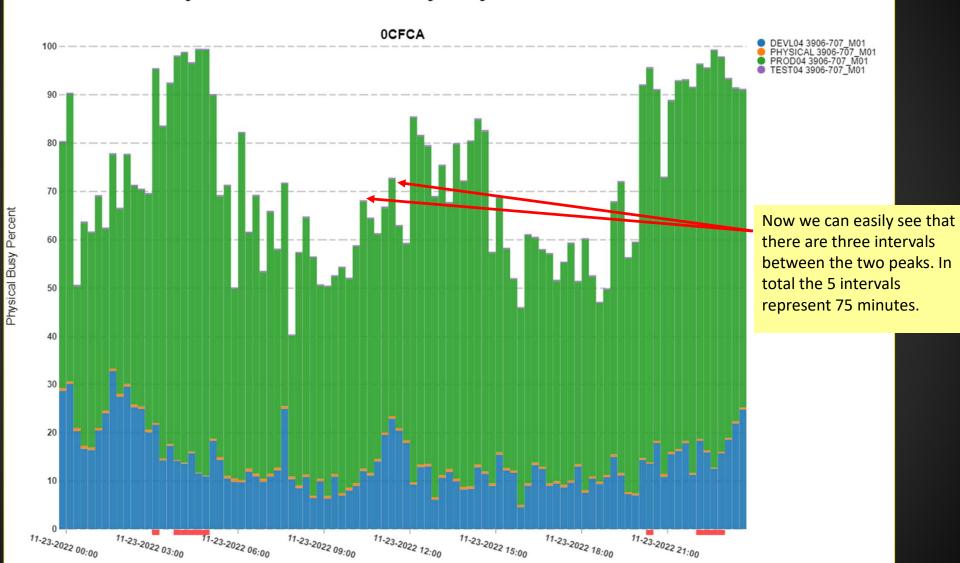 - But can also search

Pivotor lets you focus on the data

Notice how much of the UI is the chart instead of confusing and/or complicated user interface elements.

Visualizations should promote understanding

- Pivotor prefers column charts that make the it easy to understand the intervals involved

- Column widths denote interval duration, making it easy to spot intervals of unusual duration

- Pivotor color scheme was chosen to try to help make the chars accessible to color blind users
    - Although no color scheme will be perfect for everybody!

CEC Physical Machine CP Busy% by CEC Serial Number

Changed from our default column graph to an area graph like some products seem to prefer. How many intervals between these peaks?

CEC Physical Machine CP Busy% by CEC Serial Number

0CFCA

Now we can easily see that there are three intervals between the two peaks. In total the 5 intervals represent 75 minutes.

Pivotor reports are already run

- Pivotor runs all the reports in batch and stores them for later use
  - We store the data compressed and we have lots of storage!
- Super fast: no waiting on fetching data from a large database
- Pre-run does *not* mean just static pictures
  - Fly-over hover text with further information
  - Zoom into smaller sections of the report
  - Dynamically load multiple days
  - "Explorer" charts let you build a report on the fly for a specific entity
    - E.G. to answer questions like what was this batch job's elapsed time over the past year?
  - Automatic, intelligent aggregation/disaggregation for long-term reports

Security: Simplicity

- Because reports are pre-run, only simple static files are stored on the web servers
  - Web servers execute no dynamic code and can't even connect to other servers
- Apache provides the authentication and authorization via Auth0
  - We let the experts write the security-sensitive code!
  - Can SAML-federate with your IdP so you can control who has access to your reports
- Penetration tests are "boring" because the attack surface is extremely small

Security: Separation

- Customers' data are all logically separated
- Separate directories for files
    - Customers' files are not intermingled in the same directory on any server
    - Apache enforces security at the directory level
- Separate database schemas for each customer/plex
    - Customers' data are not comingled in the same tables
        - Yes, we have thousands upon thousands of individual tables!
    - Reporter can only report on a single schema at a time
- Human mistakes of course could happen, but everything is structured to make it difficult to accidentally comingle customers' data

Security: Standards

- HTTPS enforced with HSTS (A+ from Qualys)
- SFTP and FTPS supported and encouraged (but not enforced)
- All disks encrypted, all backups stored in encrypted S3 buckets
- Expect to have ISO 27001 certification shortly
  - Continually monitoring compliance with Drata
  - See also https://trust.epstrategies.com

Security: Safety

- Run in AWS
  - Shared responsibility model where AWS takes care of infrastructure security
- Continuous availability of web reports
  - All reports are dual published to two webservers (VA and OH)
  - Users are routed to the most responsive available server
- We're mainframe people: we have backups and DR plans
  - Most data is backed up two ways
  - Regularly tested DR plan to move to OH if a meteor takes out VA

Summary

Pivotor is not just a tool to graph metrics

- Pivotor is made and used by z/OS performance experts
- Pivotor is for z/OS performance analysts of all skill levels
  - Pivotor strives to improve your understanding of z/OS performance
- Pivotor's architecture makes exploring performance reporting fabulously fast and super secure
- Pivotor's pricing is affordable for shops of all budgets

- We're really good at turning SMF data into useful information!

Demo time!