Performance Analytics with TDSz and TCR

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Session Number

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Agenda

- How did this presentation come about?
- Business and Data Center Analytics
  - TDSz and TCR Capabilities
- TDSz Overview
- TCR Overview
- Short Demo

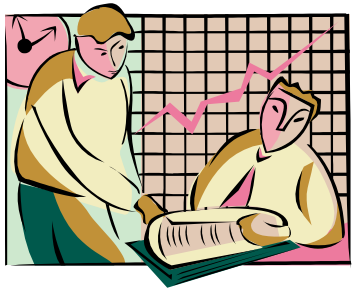
How did this Presentation get here?

- This solution is now fully in use by members of IBM ATS/Washington Systems Center for Performance analysis
- Implemented to finally replace dependence on SLR
- Excellent tool to go far beyond RMF Reports
  - Analysis of SMF 30, 42, 99, 113 records and others
  - Allows analysis of many other data types not fully exploited by ATS team yet
  - Supports Distributed platforms
  - Flexible enough to allow customized log definitions to support log data from other data types

Quick TDSz Overview

- Tivoli Decision Support for z/OS collects data from various sources and uses a central repository for easy access to historical enterprise-wide IT reporting. This provides valuable information on performance, service level management, and usage accounting.

Performance



Accounting & Chargeback

Service Level Reporting

http://www-01.ibm.com/software/tivoli/products/tds-zos/

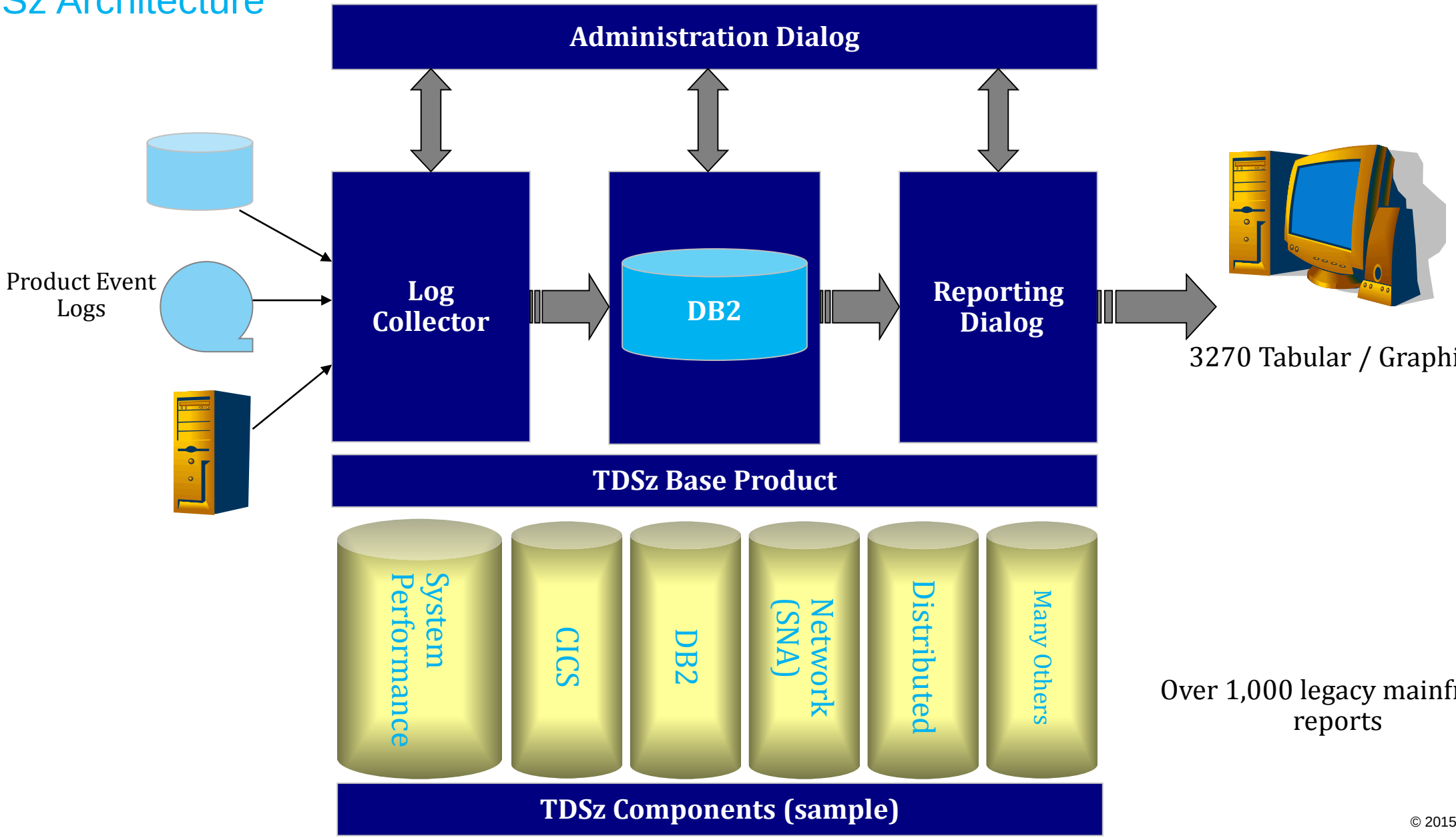
More on TDSz

- The primary function of TDSz is to read, convert, combine, and aggregate systems management data and store it in a DB2 database
- Data aggregation over a long period provides historical view of data. TDSz typically stores data in hierarchies of hourly, daily and monthly tables
- TDSz also provides reporting capabilities for display and analysis
- Performance measurement, capacity management, accounting and service level agreement support are typical use cases

Solution Capabilities

- TDSz
  - Day to day management
  - Service level monitoring
  - Historical trends
  - Highly customizable product to define only data you want collected and reports that can be created
- TCR
  - Robust and flexible reporting providing greater insight
  - Built on the strength of Cognos
    - Version 3 of TCR comes with Cognos 10
  - Can build dynamic and active reports to fit specific business requirements
    - Little to no knowledge of SQL needed
  - Cognos Workspace can be used to combine data/charts from multiple defined reports

TDSz Architecture

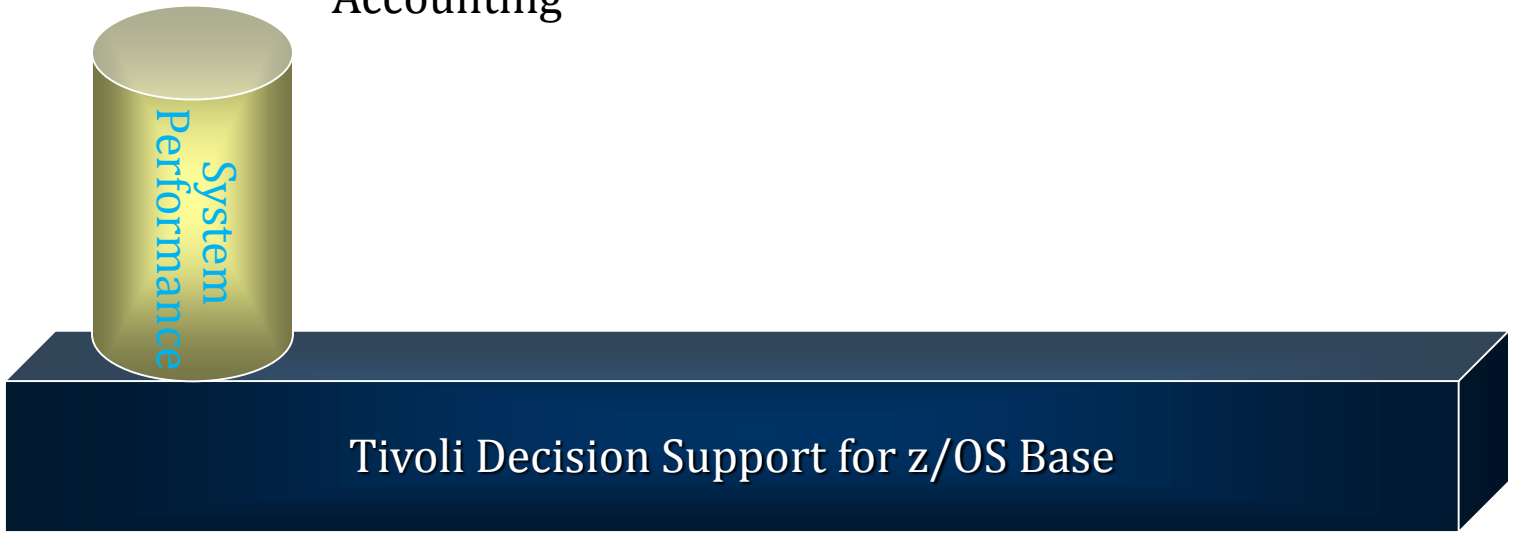


Over 1,000 legacy mainframe reports

TDSz System Performance Feature

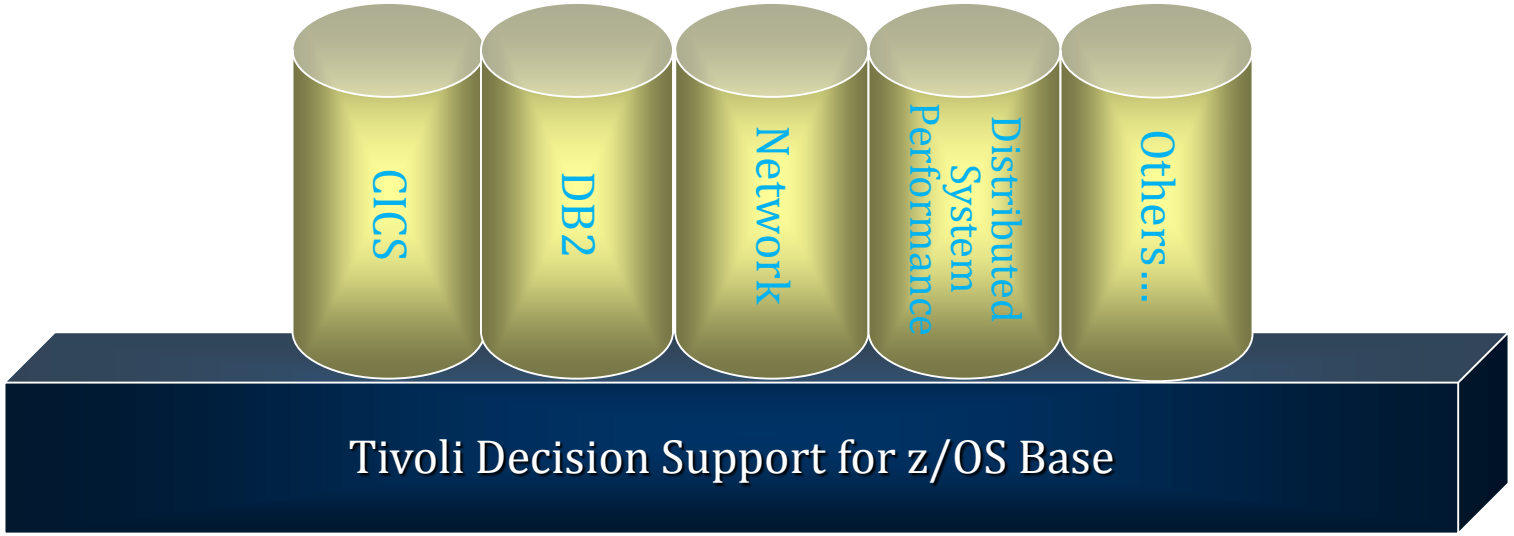
- Partial List

Data set	DFSMS	HTTP Server
DB2	TCP/IP	WebSphere Application Server
SMS	Tivoli Workload Scheduler for z	WebSphere Message Broker
RMM	z/OS System	WebSphere MQ for z
RACF	z/OS Performance Mgmt	z/VM Performance
Message Analysis	z/OS Interval Job/Step Accounting	Linux on z



Other Components of Interest

- Specific reports and tables are available in different pre-built components with TDSz
- Supports input from many different log types, ie. SMF, IMS Logs, distributed server information



What is a Component

- A component contains a set of definitions that define the records to be collected, tables and views to hold the data, and the pre-built reports used to analyze the data
- For example, MVSPM component:
  - SMF Log definitions for SMF 30, 42, 70:78 records
  - Set of table, column and view definitions for what data from above records to collect
  - Set of Pre-built reports included with this component
  - Collects records in hourly, daily, weekly, and for some records monthly tables
    - Data collection can be adjusted so hourly tables are at some other (ie. RMF) interval

TDSz Database

- The TDSz database comprises:
- Data tables
  - For example DRL.MVSPM_LPAR_H
  - Log collector collects data from logs and stores them in data tables
- System tables
  - For example DRLSYS.DRLRECORDS, DRLSYS.DRLUPDATES
  - Tell log collector how to interpret and collect logs to data tables
- Lookup tables
  - For example DRL.MVS_MIPS
  - Used by log collector to provide values to group or interpret input log data
- Control tables
  - For example DRLSYS.DAY_OF_WEEK
  - Control results returned by some log collector functions

New Key Performance Metrics Components in TDSz 1.8.2

- New KPM Components are available for z/OS, DB2, CICS, and IMS
- The new z/OS KPM component is made up of the following sub-components:
  1. Address Space Statistics (SMF type 30)
  2. LPAR Statistics (SMF type 70)
  3. Storage Statistics (SMF type 71)
  4. Workload Statistics (SMF type 72_3)
  5. Capture Ratio - Install 2&4 first.
  6. Channel Statistics (SMF type 73)
  7. Coupling Facility Statistics (SMF type 74_4)
  8. Hardware Capacity Statistics (SMF type 113_2)
  9. Problem Determination (SMF type 99)

KPM – z/OS Continued

- All subcomponents contain Timestamp-based tables as well as Hourly tables
  - except subcomponent 7 and 8 which contain Timestamp-based tables only

- Address space statistics contains tables which collect SMF type 30 subtype 2&3 (Interval) records, per SMF interval. This functionality is not currently available in TDSz (SMF type 30 interval reporting).
  - Also contains tables which collect SMF type 30 subtype 4 (Step End) records

- Customers will be able to collect to either the Timestamp-based tables, or the Hourly-based tables, or both. In other words, customers would not need to collect to the Timestamp-based tables first in order to collect to the Hourly tables (as per existing TDSz functionality)

- The data tables which collect RMF SMF records (subcomponents 1 to 6) will contain calculations similar to the RMF PostProcessor report calculations

- New metrics are provided with the KPM zOS Component which do not currently exist elsewhere in TDSz, for example Capture Ratios
  - Full details will be provided in the V182 release HOLDDOC

KPM Components – Exception Reporting

- TDSz V1.8.2 introduces built-in exception reporting into the KPM subcomponents:
- Any figure that breaches a pre-defined threshold will be written to an exception table for easy reporting and investigation.

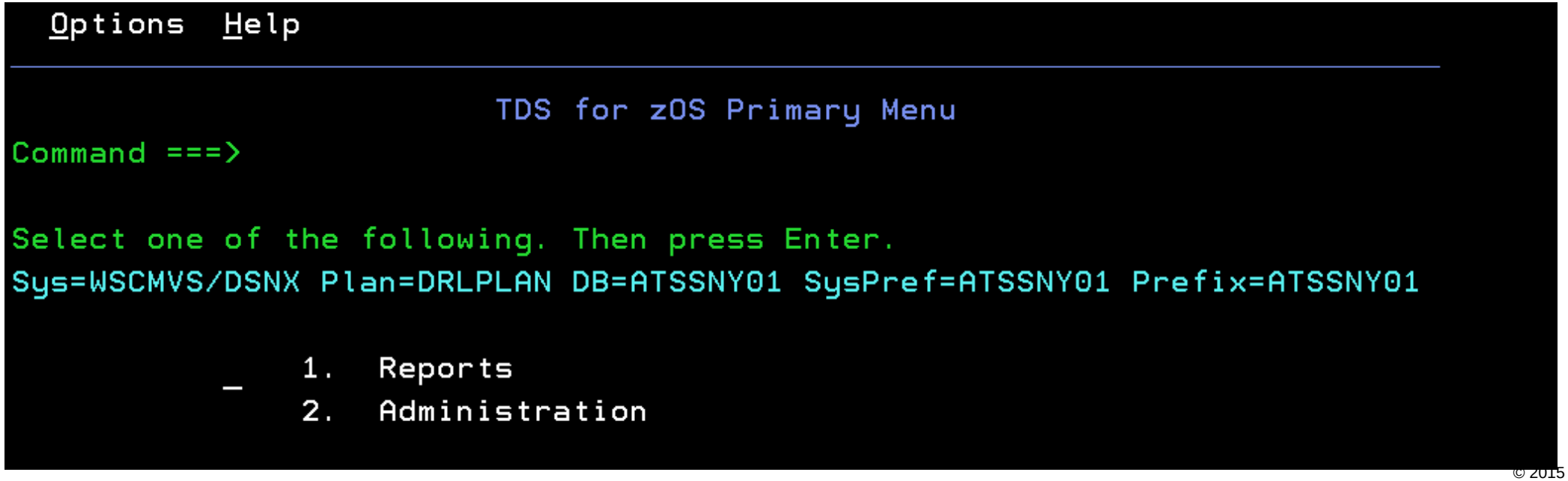
- These are the default Exception Thresholds supplied with TDSz V1.8.2:

EXCEPTION_ID	THRESHOLD	EXCEPTION_DS
LPAR_BUSY	90.0	LPAR Busy > 90%
CHAN_BUSY	50.0	Channel Busy > 50%
WLM_PI_MAX	1.1	Performance Index > 1.1
WLM_PI_MIN	.7	Performance Index <= 0.7
STOR_AVLBL	768000.0	Storage Frames Available < 768 000
CF_BUSY	50.0	Coupling Facility Busy > 50%

- These values can be changed in lookup table KPM_THRESHOLDS.

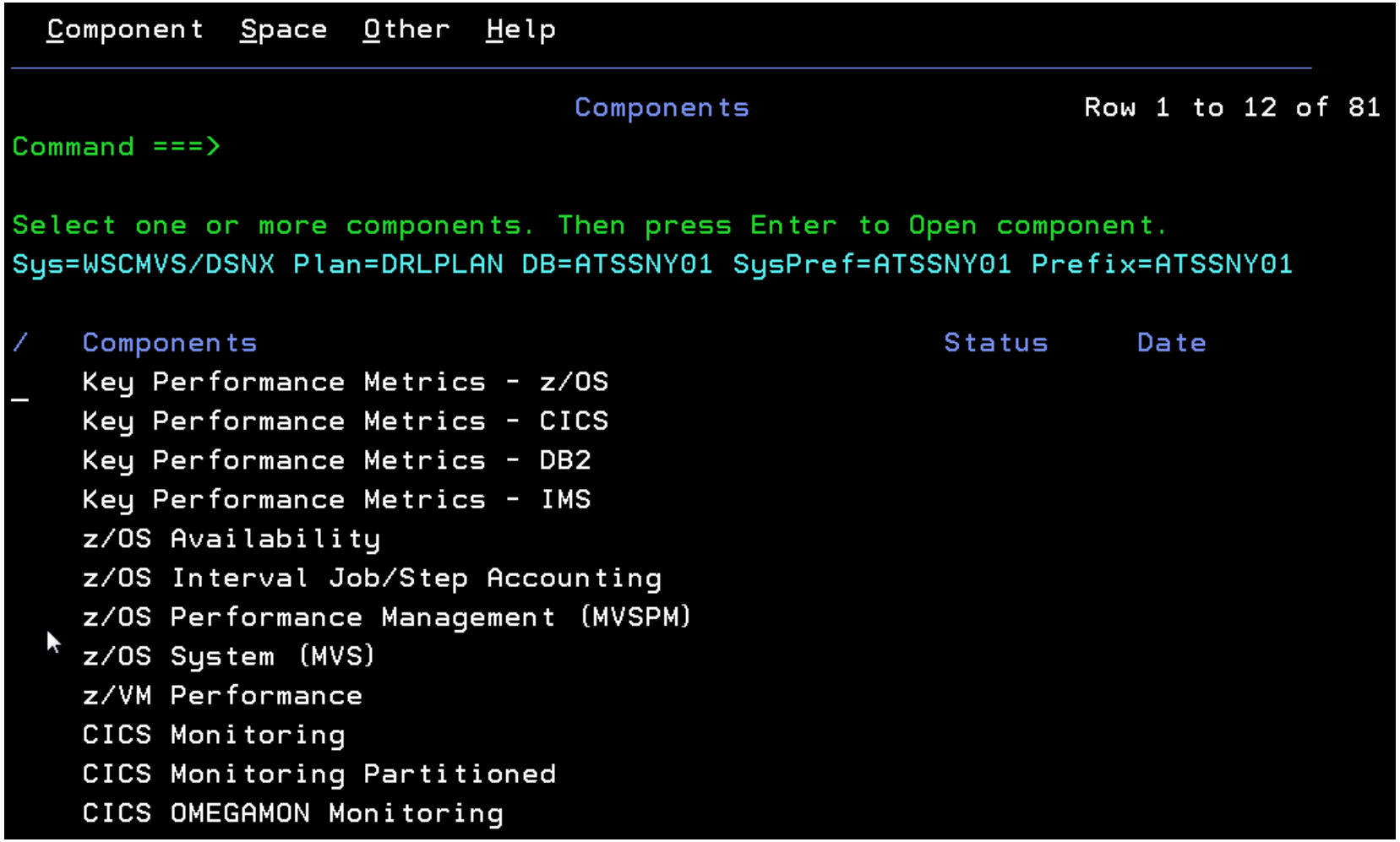
Administering TDSz

- TDSz requires a dedicated administrator, preferably someone with DB2 skills or someone who will work with DBA
- Interaction is controlled by dialog parameters specified in a profile
  - Is user an administrator or not
  - What level of access should be granted
- Non-administrator users may also access data for reporting and analysis
- Example of Administrator primary screen:



Components Example

- Many pre-built components are ready for install
- Only install those components needed for your data analysis
  - Each component will add the definitions for additional records and tables to collect more data. This will consume more CPU and take longer than necessary if collecting unneeded data
  - For example, don't install MVS and MVSPM components if you will only be using tables in the MVSPM component



Out of the Box Reports

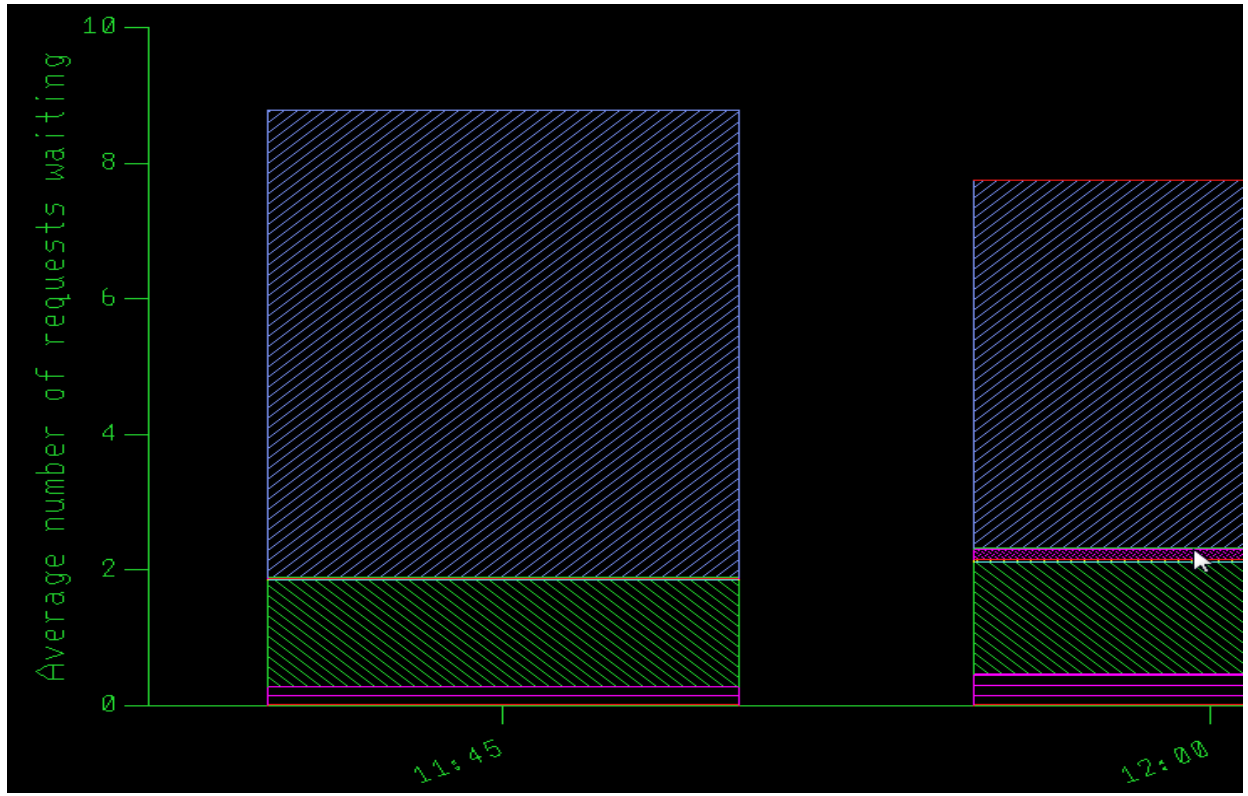
- Within TDSz, each component has a set of pre-built reports that can be used immediately

```
Sys=WSCMVS/DSNX Plan=DRLPLAN DB=ATSSNY03 SysPref=ATSSNY03 Prefix=ATSSNY03

Group  . . . . . : All reports

/   Report                                                ID
    MVSPM Address spaces general hourly distribution    MVSPM106
    MVSPM Address spaces In-Ready hourly distribution   MVSPM107
    MVSPM Applications Waiting on ENQs, Hourly Trend    MVSPM55
    MVSPM Applications Waiting on ENQs, Worst Case      MVSPM52
    MVSPM Average CPU Busy Profile, Hourly Trend        MVSPM08
    MVSPM Average CPU Busy, Daily Trend                 MVSPM06
    MVSPM Average CPU Busy, Hourly Trend                MVSPM07
    MVSPM Avg CF Busy Profile, Hourly Trend             MVSPM68
    MVSPM Avg CF Storage Usage, Hourly Trend            MVSPM69
    MVSPM APPC CPU and I/O by Transaction Class         MVSPM62
```

Report Example

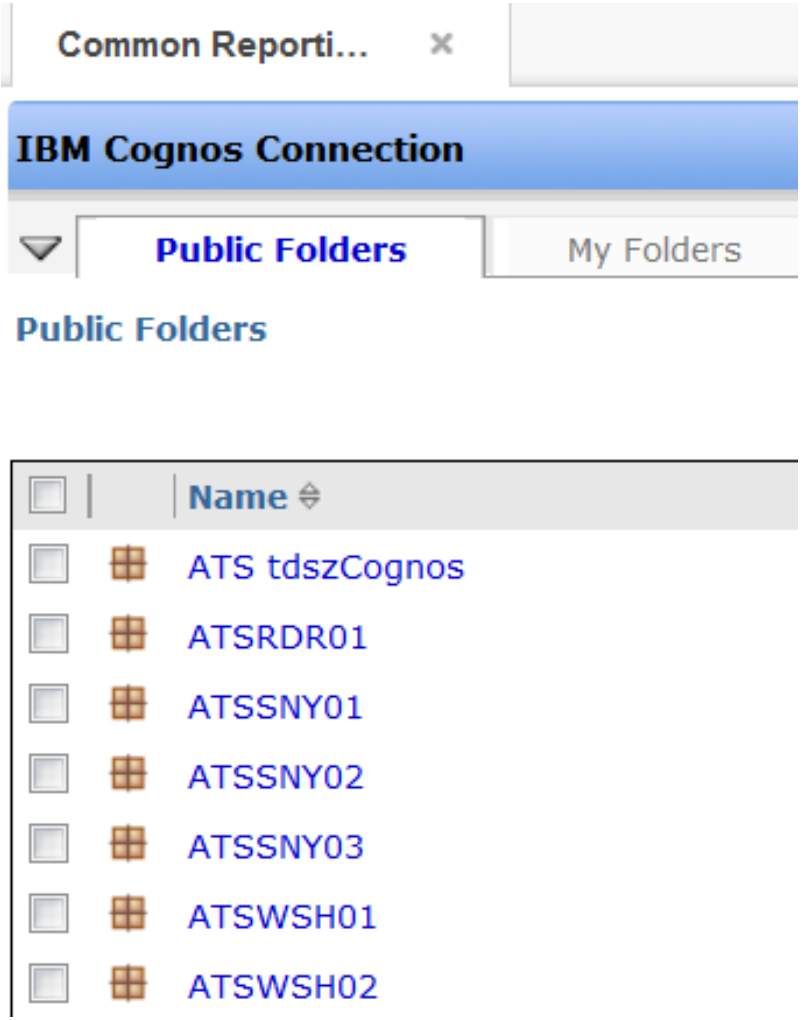
- Pre-built reports typically have both required and optional filters
  - Prompts can be filled in using ‘PF4’ to find valid filter parameters
- Output will be either text table and/or graphical display of data
- Data tables saved into specified output files

```
Report . . . : MVSPM Applications Waiting on ENQs, Hourly Trend

Variable            Value                                    Oper  Req
DATE                2015-01-12                  >  +  =      Yes
MVS_SYSTEM_ID       _                           >  +  =      Yes
PERIOD_NAME                                     >  +  =      No
QUEUE_NAME_LIST                                 >  +  IN     No
****************************** Bottom of data ********************************
```



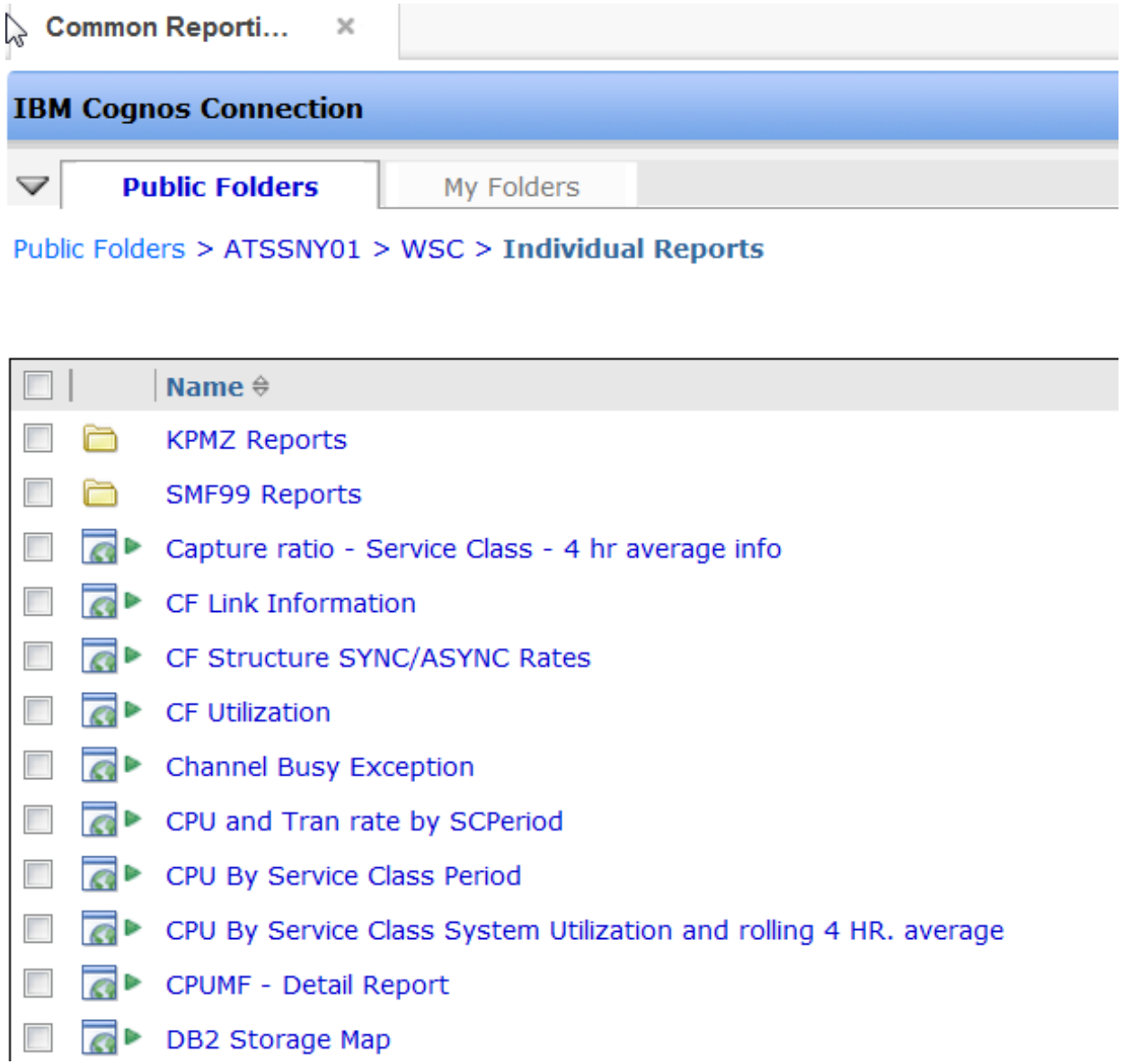
Tivoli Common Reporting V3.1

- Built on the strength of Cognos 10
- Requires JazzSM
- Report Packs available on Developerworks web site to get you started with basic set of reports to analyze your TDSz data
- Most customers will only have one database to contain all TDSz data in the enterprise for collection
  - Specific ATS environment requirements necessitate multiple databases
- Supported on many distributed platforms
  - Including Linux on z Systems



Reports Example

- Reports can be designed and saved to be run either on a schedule or ad-hoc as needs arise
- Reports can be saved as PDF, HTML, or EXCEL files for distribution or for later analysis
- Can easily and rapidly combine data from different areas into a single report of your choosing
  - For example, CPU demand by Service class from RMF 72 records combined with partition rolling four hour average from RMF 70 records
  - DB2 performance data with RMF data



Active Report

- An active report is an MHTML Document that contains both report formatting and data
- Fully interactive and can be saved for later viewing or distribution


New Report(1).mht


Active Report 1 - CPU Utilization - Hourly Tables.mht

- Warning: Files can become large for complex reports

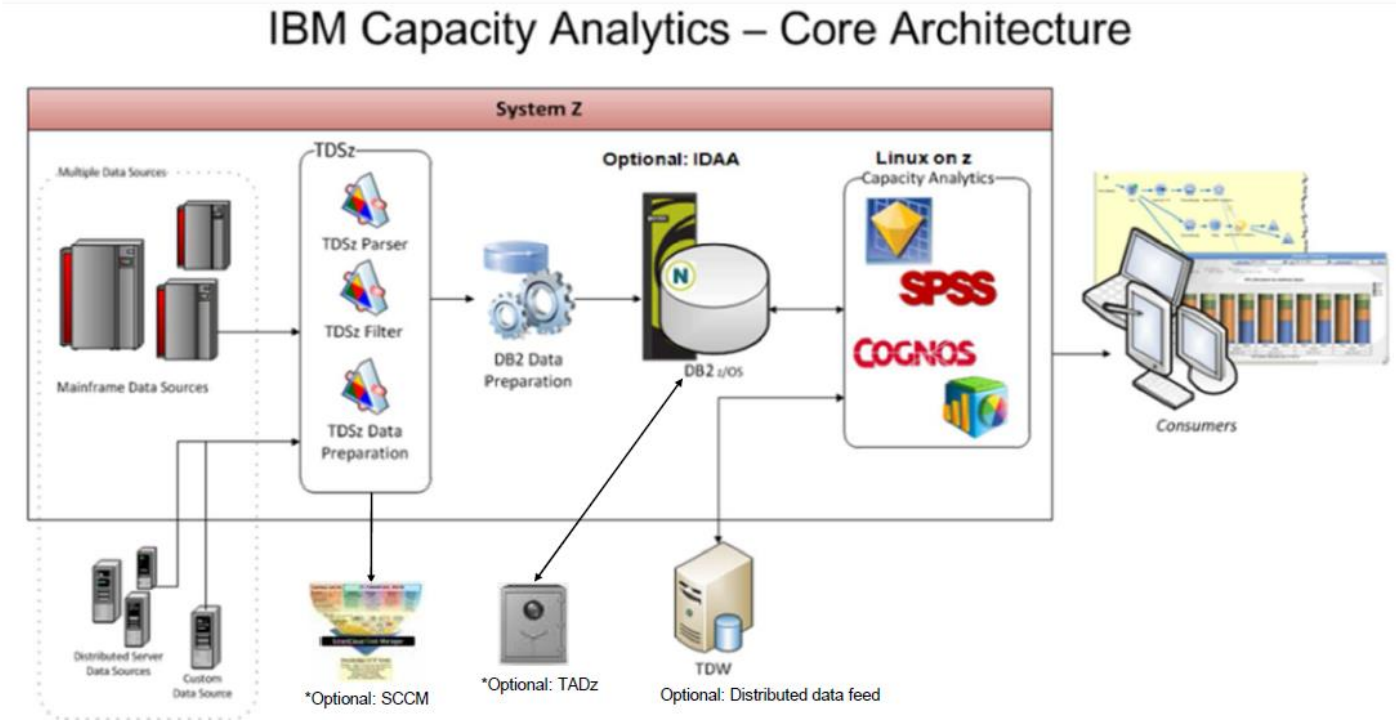
- A report is either an active report or a standard report
  - Cannot export data from report into active report format
  - Cannot export data in active report into other tools

Example of Creating a Report

- Interactive Demo of creating a report…

Another View of Data

- Beyond TCR, there is the IBM zCMA solution
- Includes zCMA, and SPSS for predictive modeling of future behavior
- Built off of the same TDSz and Cognos base



Even other ways to Analyze data in TDSz

- Power of TDSz, remember as it collects data all data is in DB2 tables
- Any tool that can access DB2 data on the mainframe can be used to run queries and generate reports
  - QMF for Windows
  - Excel with DB2 access enabled
  - Cognos Business Intelligence for z/OS

Questions???

TDS for z/OS Product Support

- **Publications Library**
  - http://publib.boulder.ibm.com/infocenter/tivihelp/v3r1/topic/com.ibm.tivoli.dszos.doc_1.8.1/welcome.html
- **Technical Support Self - Help** (for registered users only)
- TDSz Wiki
  - https://www.ibm.com/developerworks/community/wikis/home?lang=en#/wiki/Tivoli%20Decision%20Support%20for%20zOS
- TDSz Forum
  - http://www.ibm.com/developerworks/forums/forum.jspa?forumID=975
- IBM Support Portal
  - http://www.ibm.com/support/entry/portal/Overview/Software/Tivoli/Tivoli_Decision_Support_for_z~OS
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