Using TDSz and TCR to Analyze Your Data

Bradley Snyder(Bradley.Snyder@us.ibm.com)
IBM Corporation

Wednesday, August 12, 2015
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 replace dependence on SLR
- Excellent tool to go far beyond RMF Reports
  - Analysis of SMF 14, 15, 30, 42, 99, 100-102, 113 records and others in addition to RMF Records
  - 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 sources
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

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

Log Collector → DB2 → Reporting Dialog

Administration Dialog

TDSz Base Product

System Performance
CICS
DB2
Network (SNA)
Distributed
Many Others

Over 1,000 legacy mainframe reports

Product Event Logs

3270 Tabular / Graphical
TDSz System Performance Feature

- Partial List

<table>
<thead>
<tr>
<th>Component</th>
<th>Tivoli Workload Scheduler for z</th>
<th>z/OS System</th>
<th>z/OS Performance Mgmt</th>
<th>z/OS Interval Job/Step Accounting</th>
<th>z/OS System</th>
<th>z/OS Performance Mgmt</th>
<th>z/OS Interval Job/Step Accounting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data set</td>
<td>DFSMS</td>
<td>HTTP Server</td>
<td>WebSphere Application Server</td>
<td>WebSphere Message Broker</td>
<td>WebSphere MQ for z</td>
<td>z/VM Performance</td>
<td>Linux on z</td>
</tr>
<tr>
<td>DB2</td>
<td>TCP/IP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SMS</td>
<td>Tivoli Workload Scheduler for z</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RMM</td>
<td>z/OS System</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RACF</td>
<td>z/OS Performance Mgmt</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Message Analysis</td>
<td>z/OS Interval Job/Step Accounting</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Other Components of Interest

- Specific reports and tables are available in different pre-built components with TDSz
- Supports input from many different log types, i.e., 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 (i.e. RMF) interval
    - Based on MVSPM_TIME_RESOLUTION table
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 subcomponents 8 and 9 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 z/OS Component which do not currently exist elsewhere in the MVSPM component, for example Capture Ratios and PI values
  - 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:

<table>
<thead>
<tr>
<th>EXCEPTION_ID</th>
<th>THRESHOLD</th>
<th>EXCEPTION_DS</th>
</tr>
</thead>
<tbody>
<tr>
<td>LPAR_BUSY</td>
<td>90.0</td>
<td>LPAR Busy &gt; 90%</td>
</tr>
<tr>
<td>CHAN_BUSY</td>
<td>50.0</td>
<td>Channel Busy &gt; 50%</td>
</tr>
<tr>
<td>WLM_PI_MAX</td>
<td>1.1</td>
<td>Performance Index &gt; 1.1</td>
</tr>
<tr>
<td>WLM_PI_MIN</td>
<td>.7</td>
<td>Performance Index &lt;= 0.7</td>
</tr>
<tr>
<td>STOR_AVLBL</td>
<td>768000.0</td>
<td>Storage Frames Available &lt; 768 000</td>
</tr>
<tr>
<td>CF_BUSY</td>
<td>50.0</td>
<td>Coupling Facility Busy &gt; 50%</td>
</tr>
</tbody>
</table>

- 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 the DB2 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:

```
Options    Help
----------

TDS for zOS Primary Menu

Command ==> 

Select one of the following. Then press Enter.
Sys=WSCMV5/DSNX Plan=DRLPLAN DB=ATSSNY01 SysPref=ATSSNY01 Prefix=ATSSNY01

   1. Reports
   2. Administration
```
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, most components have a set of pre-built reports that can be used immediately
  - KPM Component reports still in development

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

Group : : : : All reports

<table>
<thead>
<tr>
<th>Report</th>
<th>ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>MVSPM Address spaces general hourly distribution</td>
<td>MVSPM106</td>
</tr>
<tr>
<td>MVSPM Address spaces In-Ready hourly distribution</td>
<td>MVSPM107</td>
</tr>
<tr>
<td>MVSPM Applications Waiting on ENQs, Hourly Trend</td>
<td>MVSPM55</td>
</tr>
<tr>
<td>MVSPM Applications Waiting on ENQs, Worst Case</td>
<td>MVSPM52</td>
</tr>
<tr>
<td>MVSPM Average CPU Busy Profile, Hourly Trend</td>
<td>MVSPM08</td>
</tr>
<tr>
<td>MVSPM Average CPU Busy, Daily Trend</td>
<td>MVSPM06</td>
</tr>
<tr>
<td>MVSPM Average CPU Busy, Hourly Trend</td>
<td>MVSPM07</td>
</tr>
<tr>
<td>MVSPM Avg CF Busy Profile, Hourly Trend</td>
<td>MVSPM68</td>
</tr>
<tr>
<td>MVSPM Avg CF Storage Usage, Hourly Trend</td>
<td>MVSPM69</td>
</tr>
<tr>
<td>MVSPM APPC CPU and I/O by Transaction Class</td>
<td>MVSPM62</td>
</tr>
</tbody>
</table>
```
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
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 needs of ATS environment means multiple databases are necessary
- 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

- 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 TCR...
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
- Distributed requests to TDSz (ie. from TCR) are DDF requests to z/OS DB2
  - Can be zIIP eligible
Questions???
TDS for z/OS Product Support

- **Publications Library**

- **Technical Support Self - Help** (for registered users only)

- **TDSz Wiki**

- **TDSz Forum**

- **IBM Support Portal**

- **IBM Support Center**
  - (800) 426-7378 (IBM SERV)