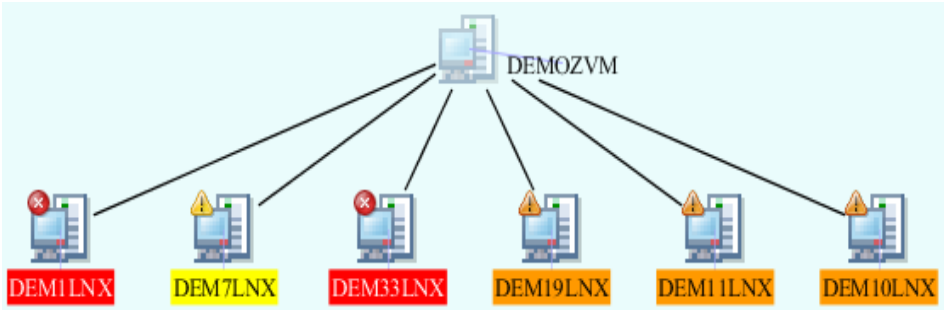

Session 17728:

Approaches to Enterprise-Wide Monitoring and Problem-Solving on IBM z Systems

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Abstract

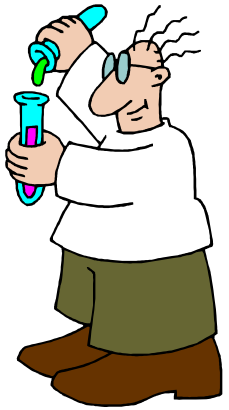
Examples of how best to leverage the OMEGAMON Tivoli Enterprise Portal to dramatically reducing problem isolation time for several critical problem scenarios.

This was accomplished by:

- Discovering how simple it was to create new views.
- Moving away from out of the box views to custom ones that matched the complex problems they were trying to solve.
- Confirming the new navigator views provided the promised savings

Agenda: Approaches to Enterprise-Wide Monitoring

- Overview
- Enterprise Views
- Mashups
- Enterprise Wildcard FINDs
- Topology Views
- Leveraging History
- Dots Health View
- Situations overrides
- Situation Audit tool

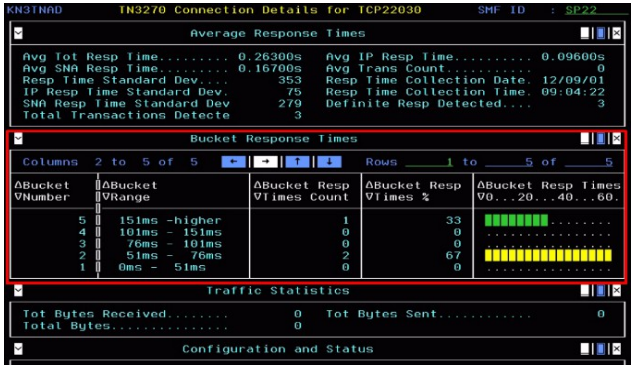


What is the TEP and e3270ui?

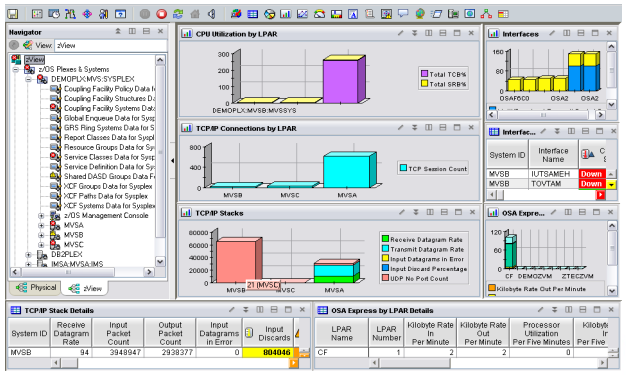
- **TEP** (Tivoli Enterprise Portal) GUI
  - Manage z/OS and distributed resources from a single interface.
  - Displays data in graphs, charts and table formats
  - View real time and historical data, at the same time
  - Workspaces, Situations, and Expert Advice
  - Configure, right from the TEP

- **e3270ui**: New OMEGAMON V5 3270 interface
  - Revolutionary new 3270 interface that takes advantage of modern technics
  - Common Feed as TEP (OMEGAMON XE agents)
  - Out of box best practice cross enterprise cross OMEGAMON views
  - Supports up to large 62x160 screen sizes and mouse hot spots

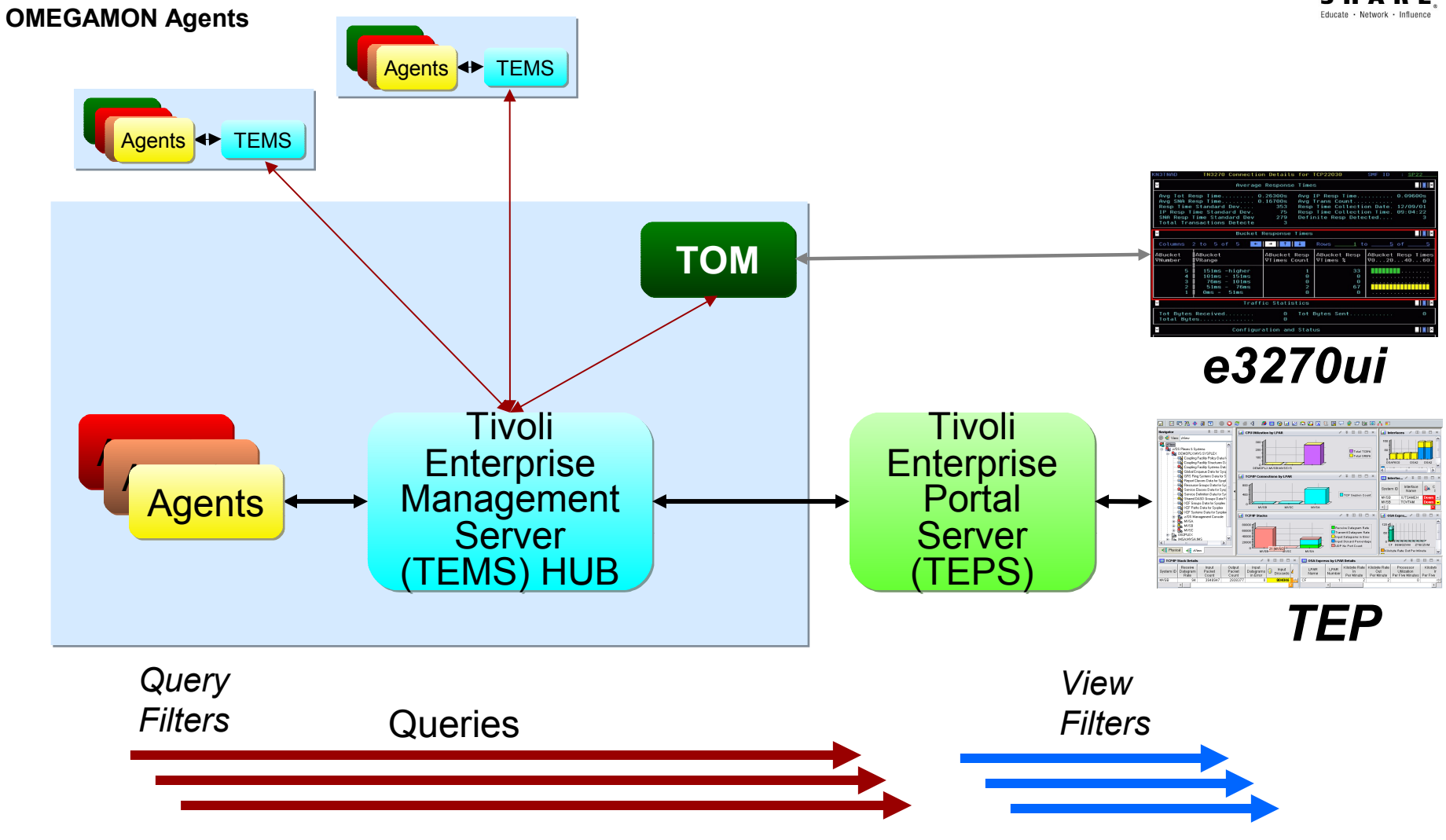
e3270ui



TEP

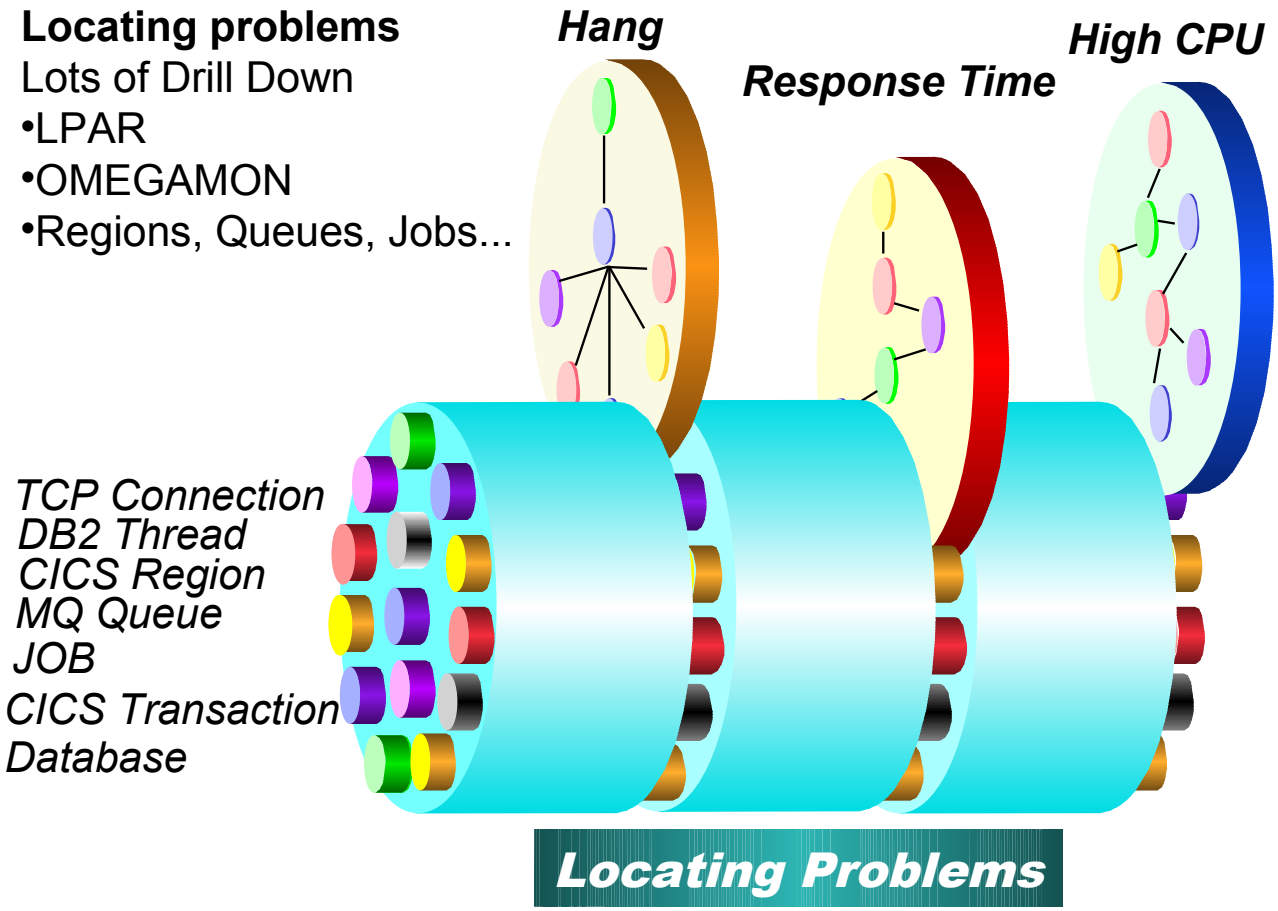


OMEGAMON XE TEP Infrastructure

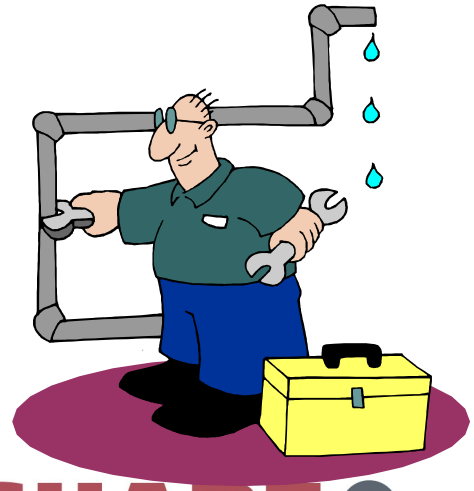


Workspaces to Match the Symptoms

Locating problems
Lots of Drill Down
- LPAR
- OMEGAMON
- Regions, Queues, Jobs...



Reduce analysis time
- Enterprise workspaces
  - Across LPARS
  - Across OMEGAMONs
  - Filter on issues



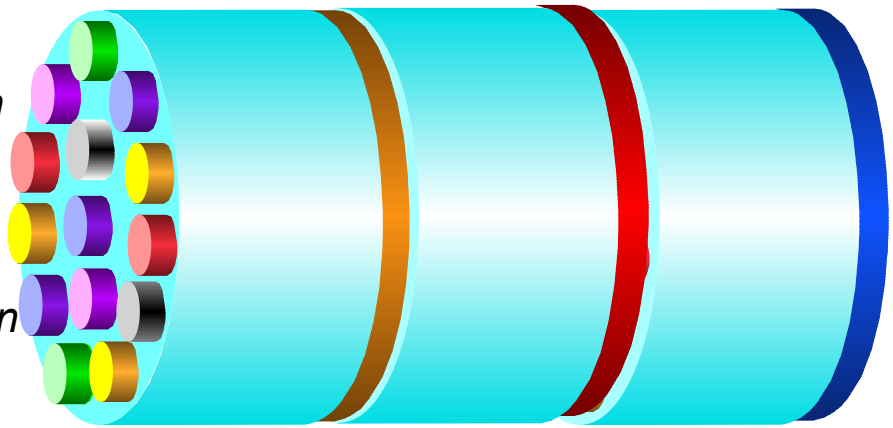
Workspaces to Match the Symptom

Locating problems ***Hang*** ***High CPU*** ***Response Time***

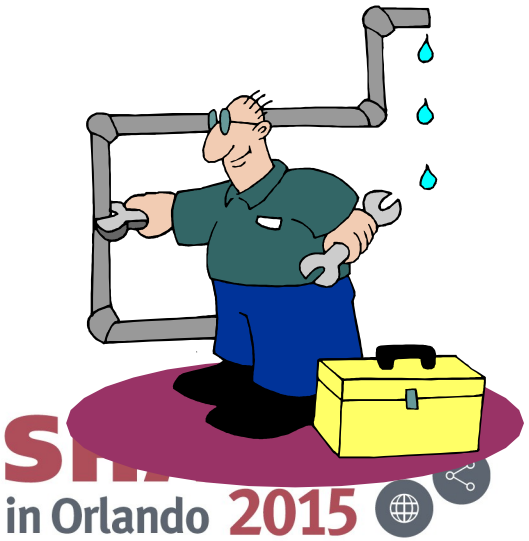
Lots of Drill Down
- LPAR
- OMEGAMON
- Regions, Queues, Jobs...

Reduce analysis time
- Enterprise workspaces
  - Across LPARS
  - Across OMEGAMONs
  - Filter on issues

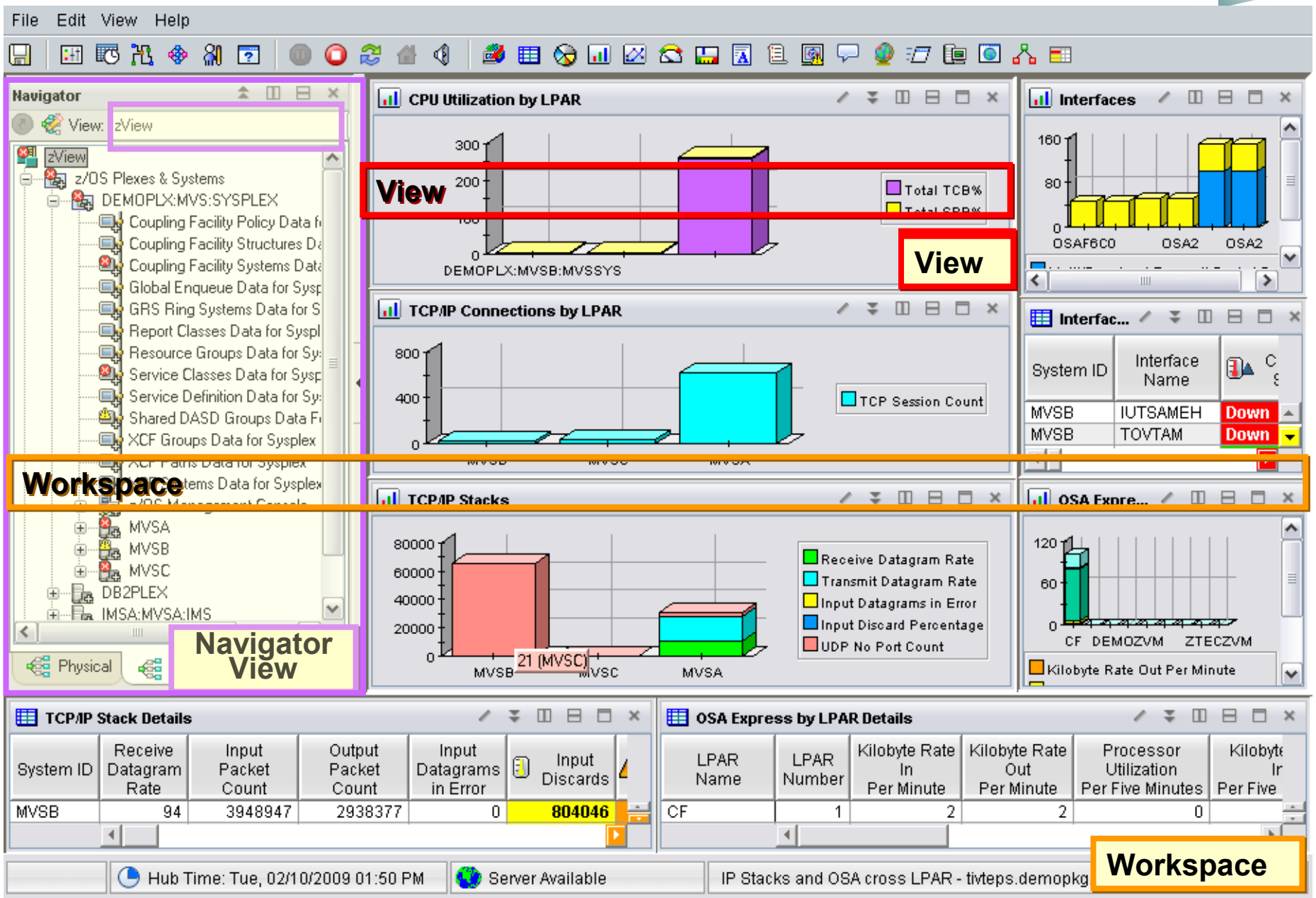
TCP Connection
DB2 Thread
CICS Region
MQ Queue
Job
CICS Transaction
Database



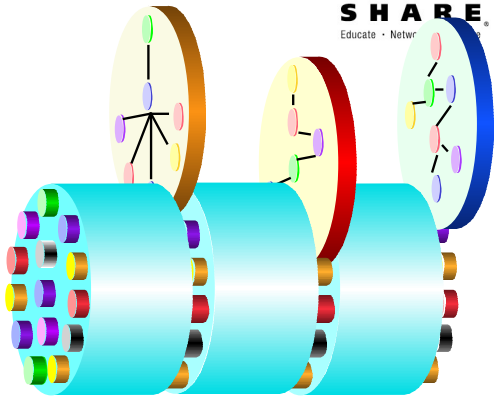
Locating Problems



TEP - Terminology

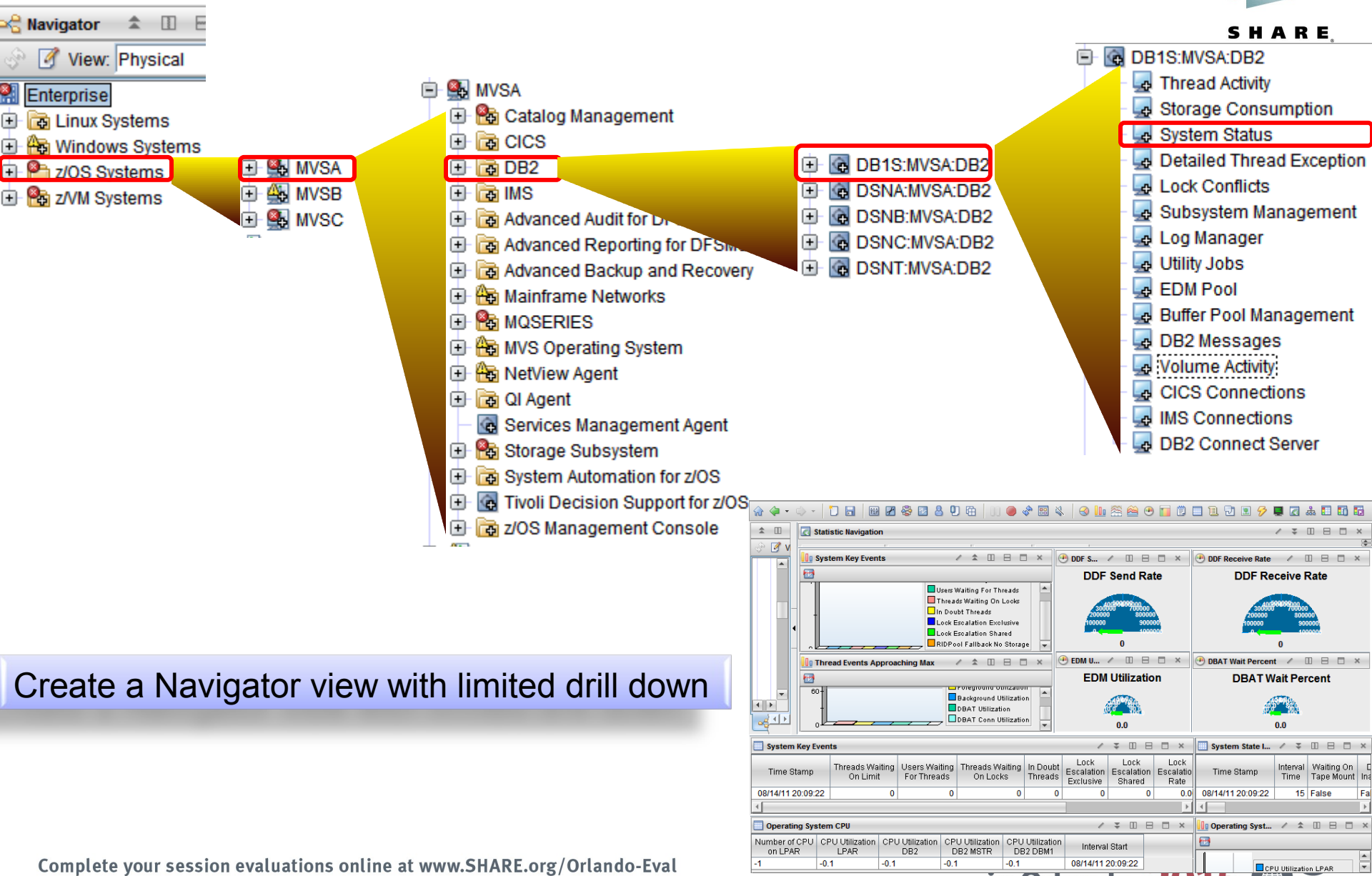


Enterprise Views



- Eliminate physical tree maze.
- Consolidated view
  - Cross LPAR
- View targeted to specific issues
  - Filtered at Agents

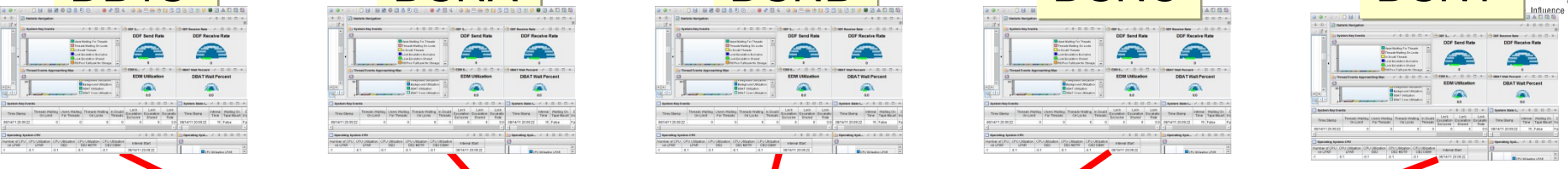
Lots of Drill down – Out of the box

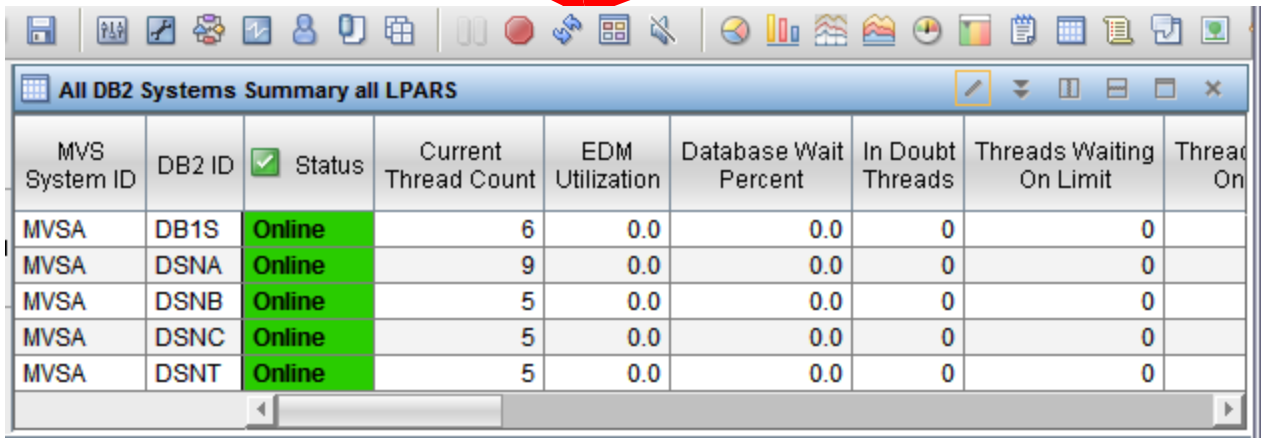


Create a Navigator view with limited drill down

Cross DB2 SYSTEM - Cross LPAR View

DB1S DSNA DSNB DSNC DSNT





All DB2 Systems Summary all LPARS

MVS System ID	DB2 ID	Status	Current Thread Count	EDM Utilization	Database Wait Percent	In Doubt Threads	Threads Waiting On Limit	Threa On
MVSA	DB1S	Online	6	0.0	0.0	0	0	
MVSA	DSNA	Online	9	0.0	0.0	0	0	
MVSA	DSNB	Online	5	0.0	0.0	0	0	
MVSA	DSNC	Online	5	0.0	0.0	0	0	
MVSA	DSNT	Online	5	0.0	0.0	0	0	

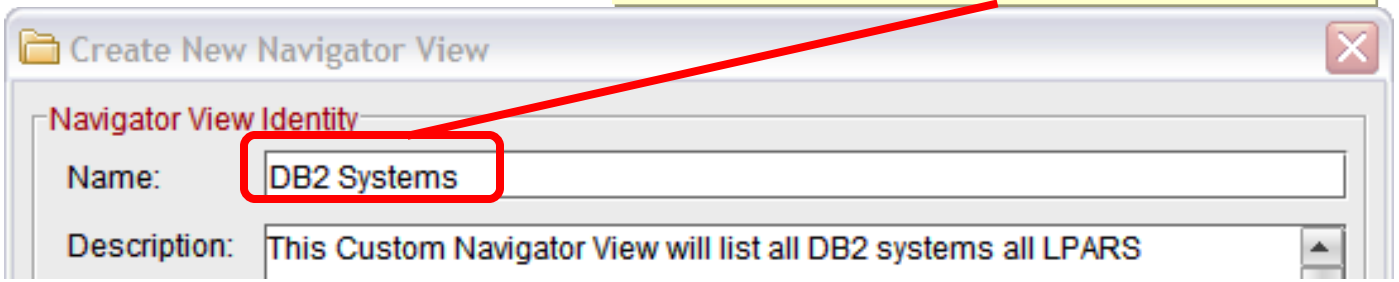
DB1S
DSNA
DSNB
DSNC
DSNT

Reduced amount of drill down

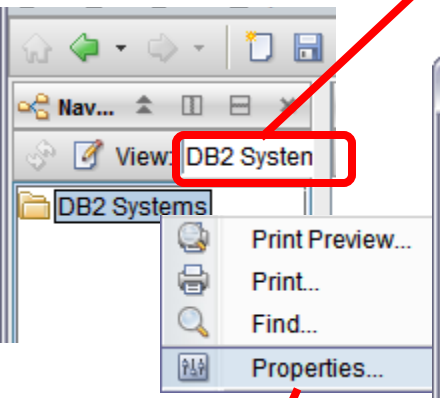
New Dynamic Navigator View

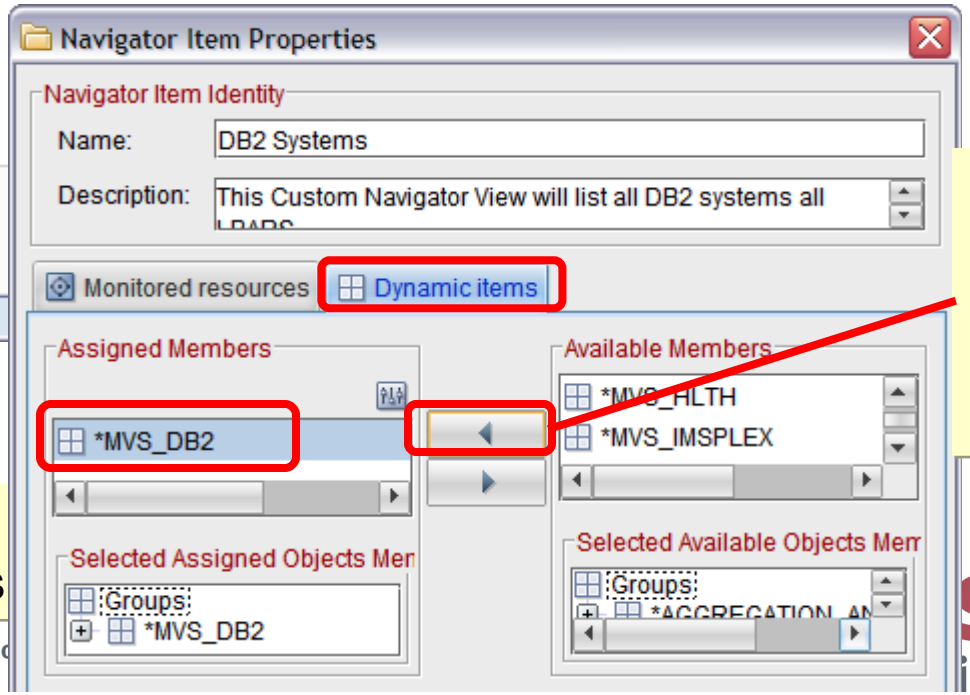
1.Edit Navigator Views

2. Create a New Navigator View



3 Close Navigator editor since we will dynamically populate.
Select the new view we just created in the navigator pull down.

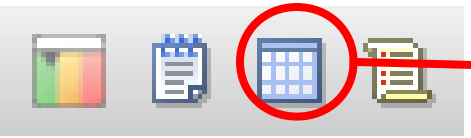




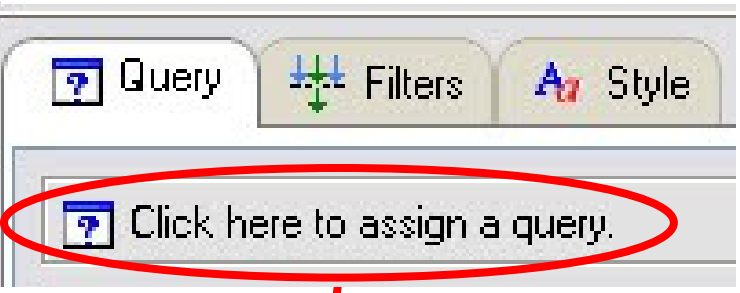
4. Right click
select Properties

5. Select *MVS_DB2
From Available Members
This is a dynamic group
of all DB2 systems on all
LPARs

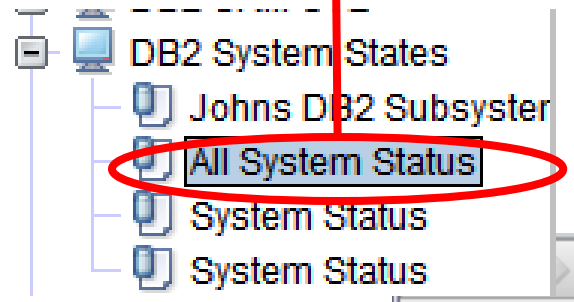
Creating a Cross System View



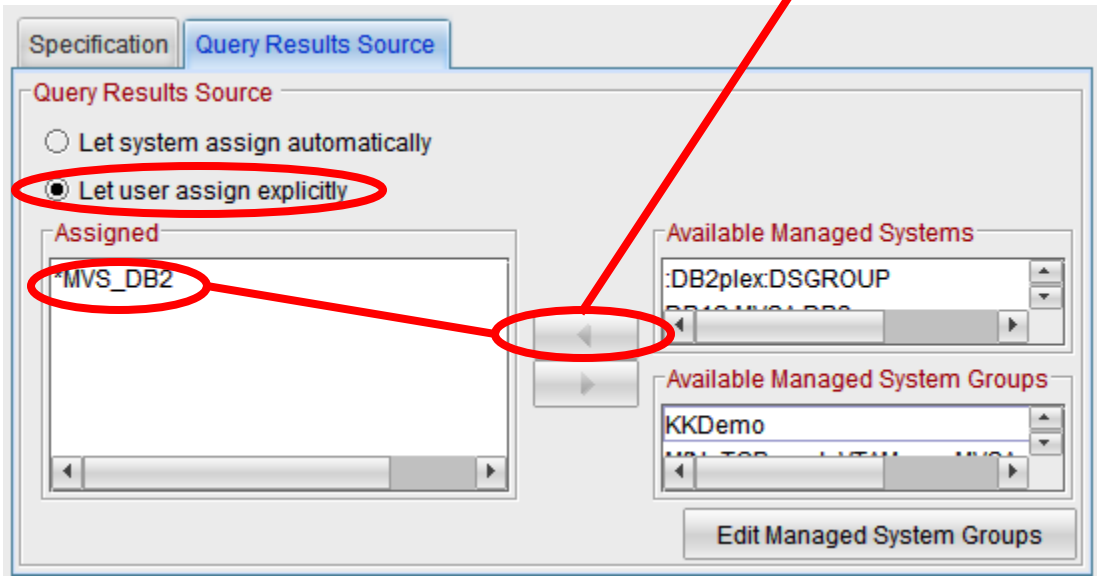
1.Select table (drag and drop)



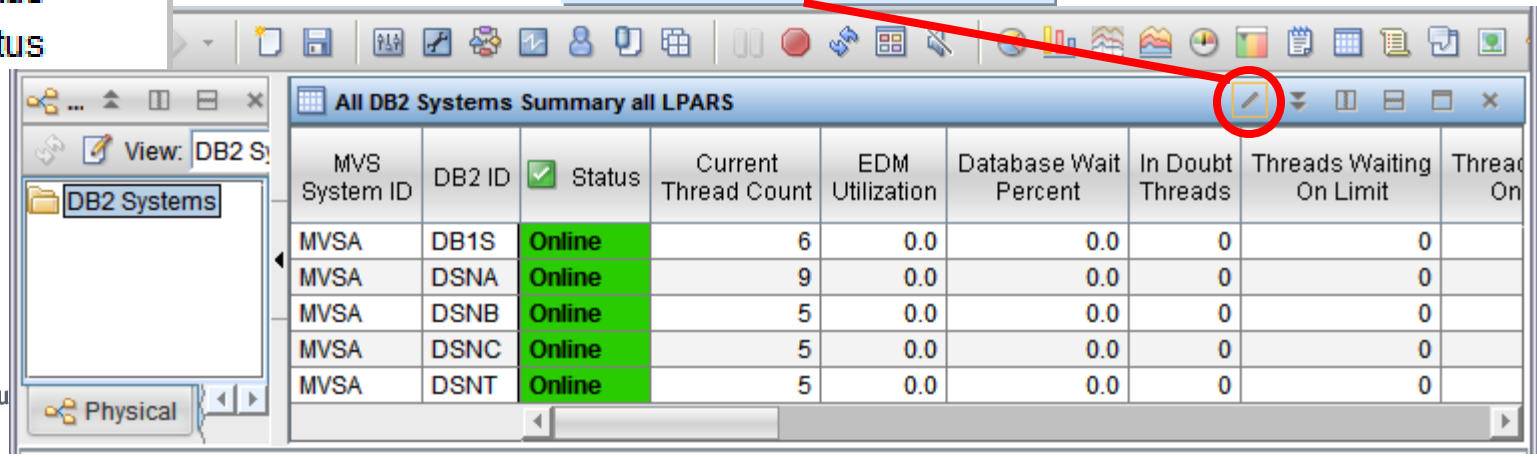
2.Assign Query



3.Assign Systems



4. Customize Table



MVS System ID	DB2 ID	Status	Current Thread Count	EDM Utilization	Database Wait Percent	In Doubt Threads	Threads Waiting On Limit	Thread On
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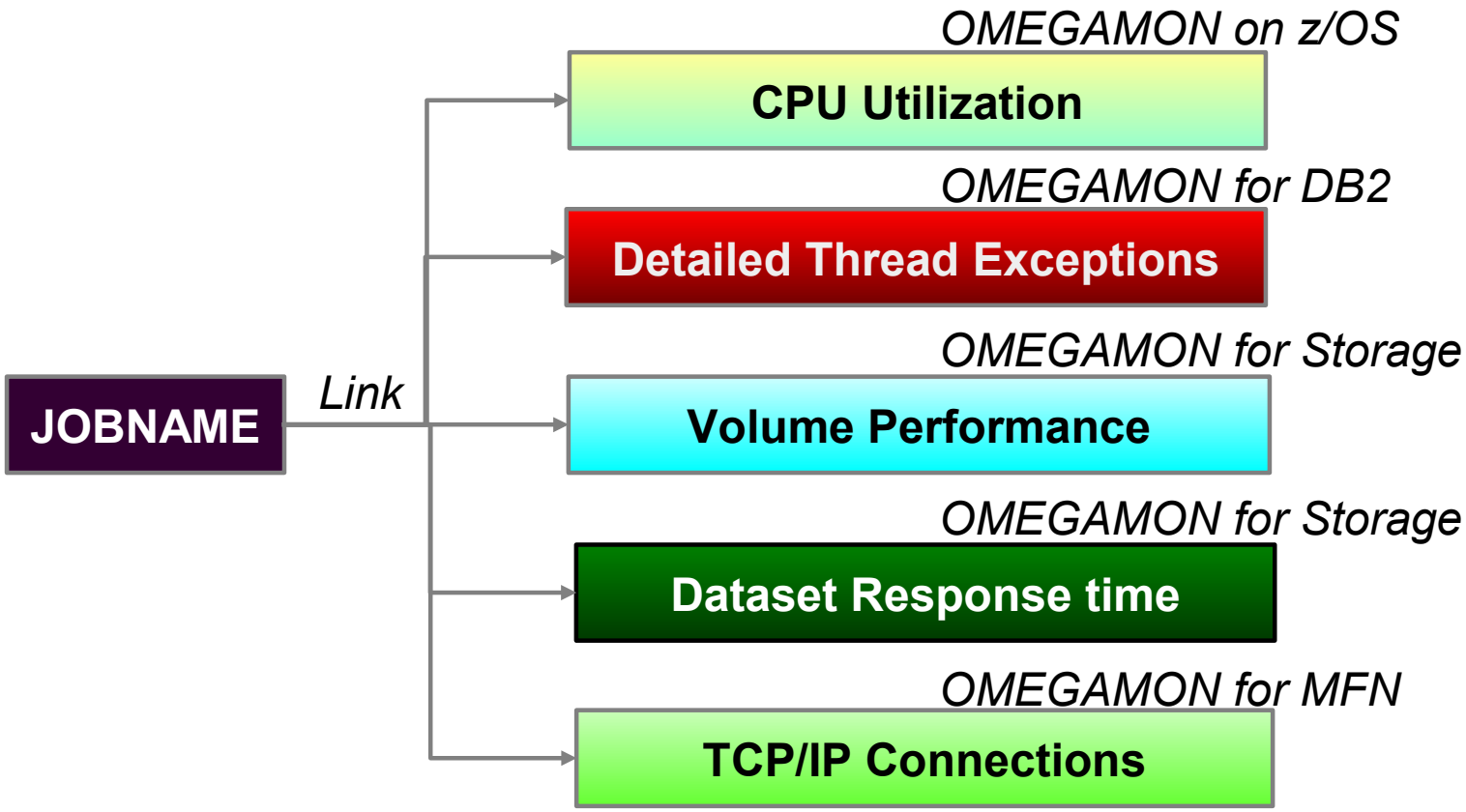
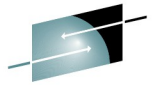
MVSA	DSNA	Online	9	0.0	0.0	0	0	
MVSA	DSNB	Online	5	0.0	0.0	0	0	
MVSA	DSNC	Online	5	0.0	0.0	0	0	
MVSA	DSNT	Online	5	0.0	0.0	0	0	

Mashup View from JOBNAME



- Use JOBNAME to assign Variables into Queries in other OMEGAMONS
- Query Source can be from all systems

Jobname Mashup (CPU, DB2, STORAGE, MFN)



CPU Utilization for Jobname

Managed System	ASID	Job Name	Step Name	Proc Step	SvcClass	SvcClass Period	JESJOBID	CPU Percent	TCB Percent	SRB Percent	IFA Percent	IFA on CP Percent	zIIP Percent	zIIP on CP Percent	Independent Enclave CPU%	Indepe Encl IFA
CARPLX1:DCU3:MVSSYS	0X010E	QCPAOT2A	JS020	PS355	BATNORM	1	JOB13861	2.2	2.2	0.0	0.0	0.0	0.0	0.0	0.0	

Detailed thread exceptions for Jobname

Originating System ID	Correlation ID	Job Name	Time Stamp	Thread Type	Connection Type	Plan Name	Package Name	Collection ID	Connection ID	Authorization ID	DB2 ID	MVS System ID
DSNJ:DCU3:DB2	QCPAOT2A	QCPAOT2A	11/07/11 10:20:40	BATCH	DB2 CALL ATTACH	PLANP0B	ELGP266	COLLP0B	DB2CALL	QCPSCH	DSNJ	DCU3

z/OS Storage VOLUME Performance for Jobname

Volume	Device Address	Busy Percent	I/O Per Second	IOSQ Delay	Pend Time	Connect Time	Disconnect Time	Response Time	MSR Connect Time Percent	I/O Count	Device MPL	DCBs Open	Reserved Percent	Current PAV Exposures	PAV Exposure Changed	Maximum PAV Exposures	Physical Device
PLB304	9455	1.8	14.8	0.0	0.5	1.2	0.0	1.8	66.7	600	26	126	0.0	n/a	n/a	n/a	_

z/OS Storage VOLUME HIGH MSR

Managed System	Response Time	I/O Count	Volume	Device Address	Busy Percent	I/O Per Second	IOSQ Delay	Pend Time	Connect Time	Disconnect Time	MSR Connect Time Percent	Device MPL	DCBs Open	Reserved Percent	Current P. Exposure
OMXETEMS:DCU3:STORAGE	159.8	175	DBD006	D16C	1.6	0.5	129.8	0.5	21.3	8.1	13.3	79	0	0.0	r
OMXETEMS:DCU3:STORAGE	159.8	175	DBD006	D16C	1.6	0.5	129.8	0.5	21.3	8.1	13.3	79	0	0.0	r
OMXETEMS:DCU3:STORAGE	159.8	175	DBD006	D16C	1.6	0.5	129.8	0.5	21.3	8.1	13.3	79	0	0.0	r
OMXETEMS:DCU3:STORAGE	147.4	477	DBD003	D169	18.3	1.5	28.1	0.7	26.4	92.0	17.9	221	0	0.0	r
OMXETEMS:DCU3:STORAGE	147.4	477	DBD003	D169	18.3	1.5	28.1	0.7	26.4	92.0	17.9	221	0	0.0	r
OMXETEMS:DCU3:STORAGE	147.4	477	DBD003	D169	18.3	1.5	28.1	0.7	26.4	92.0	17.9	221	0	0.0	r
OMXETEMS:DCU3:STORAGE	140.4	187	DBD008	D16E	0.9	0.6	124.4	0.5	10.7	4.6	7.6	84	0	0.0	r
OMXETEMS:DCU3:STORAGE	140.4	187	DBD008	D16E	0.9	0.6	124.4	0.5	10.7	4.6	7.6	84	0	0.0	r
OMXETEMS:DCU3:STORAGE	140.4	187	DBD008	D16E	0.9	0.6	124.4	0.5	10.7	4.6	7.6	84	0	0.0	r

Connection overview for Jobname

Origin Node	Application Name	Collection Time	Connection Count	Active Connections	Accepted Connections	Connection Rate	Active Connection High Water Mark	Time stamp for Active Connections High Water Mark	Idle Time Since Last Accept	Time Since Last Activity	Server Up Time	Connections in Backlog	Backlog Connections Rejected

Connect:Direct (NDM) Mashup

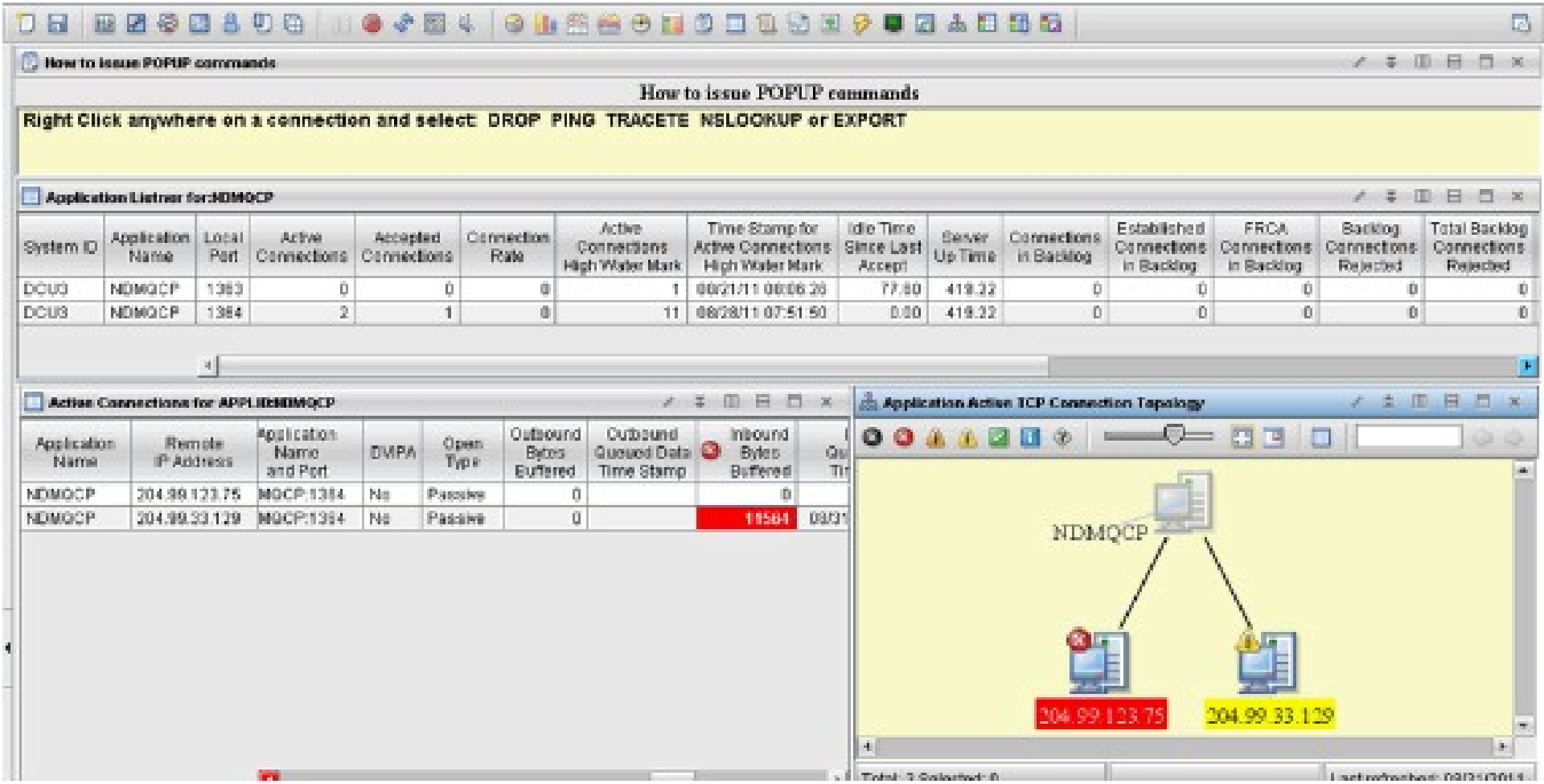
TCP/IP Listener *OMEGAMON for MFN*

- Connection Backlog Rejections
- Connection Rate

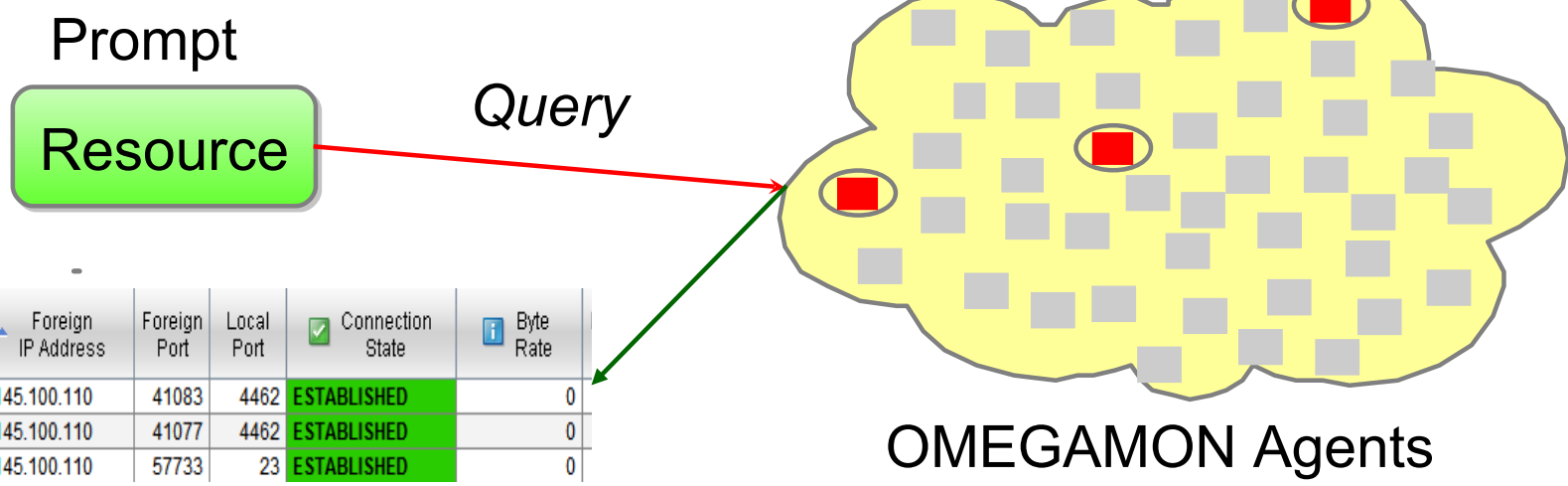
TCP/IP Connections *OMEGAMON for MFN*

- Inbound / outbound bytes buffered
- Response time
- Traffic rate
- Retries, congestion, timeouts
- Endpoints and Topology
- Commands (PING, TRACERTE, NSLOOKUP, DROP)

Connect:Direct (NDM) Mashup



Enterprise Find Command

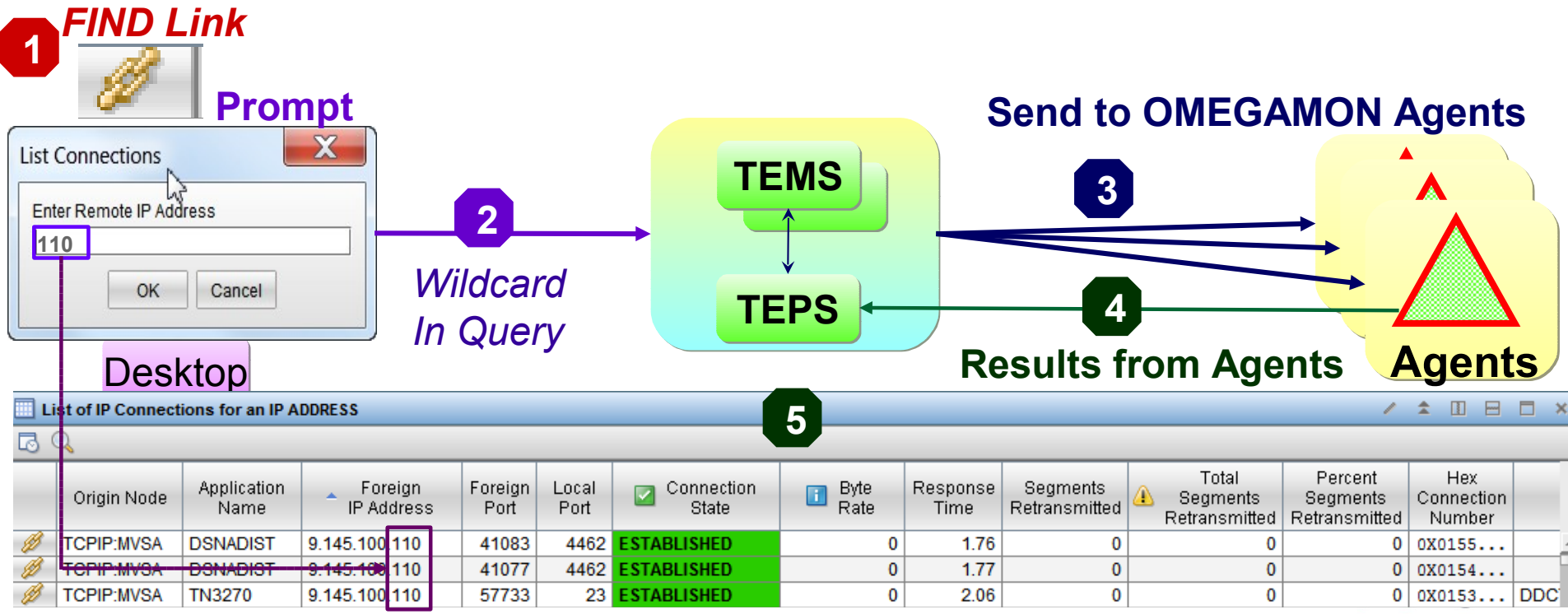


	Origin Node	Application Name	Foreign IP Address	Foreign Port	Local Port	Connection State	Byte Rate
	TCPIP:MVSA	DSNADIST	9.145.100.110	41083	4462	ESTABLISHED	0
	TCPIP:MVSA	DSNADIST	9.145.100.110	41077	4462	ESTABLISHED	0
	TCPIP:MVSA	TN3270	9.145.100.110	57733	23	ESTABLISHED	0

- A cross LPAR Wildcard search for a resource
- Examples:
  - Connections, FTPs or TN3270 sessions by IP Addresses
  - MQ Queues
  - CPU, Threads or transactions by Job Name
- Filtering is done at the OMEGAMON agents
  - Provides phenomenal performance in large environments
- Basically a LINK that generates a prompt

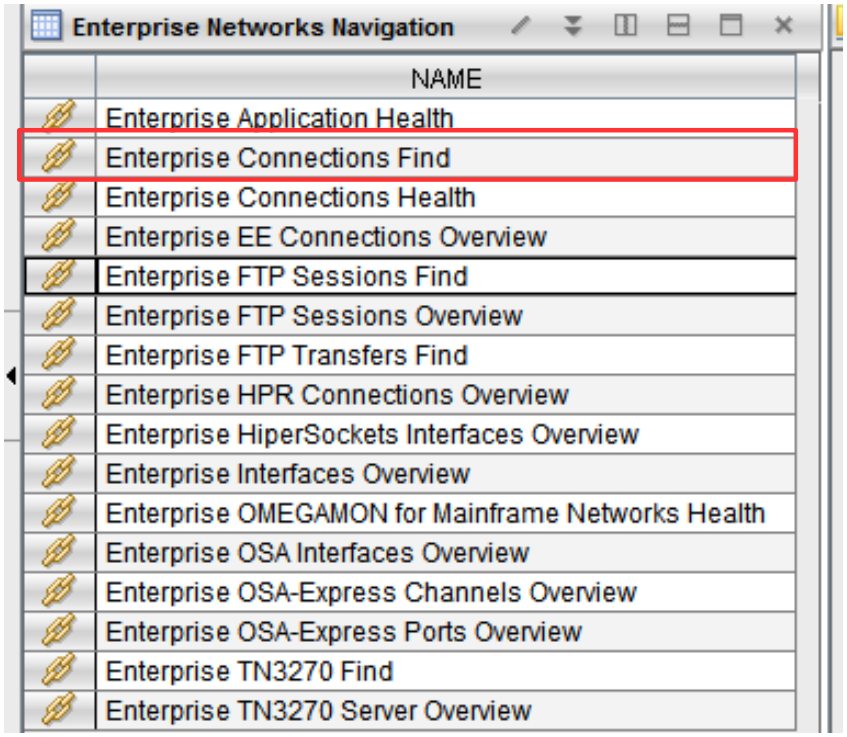
Cross Enterprise Wildcard FINDs - Overview

- A cross LPAR Wildcard search for a resource, Examples:
  - Already available with MFN Enterprise_Networks View V5.1.1
  - MQ Queues
  - CPU, Threads or transactions by Job Name
- Filtering is done at the OMEGAMON agents
  - Provides phenomenal performance in large environments
- Basically a LINK that generates a prompt

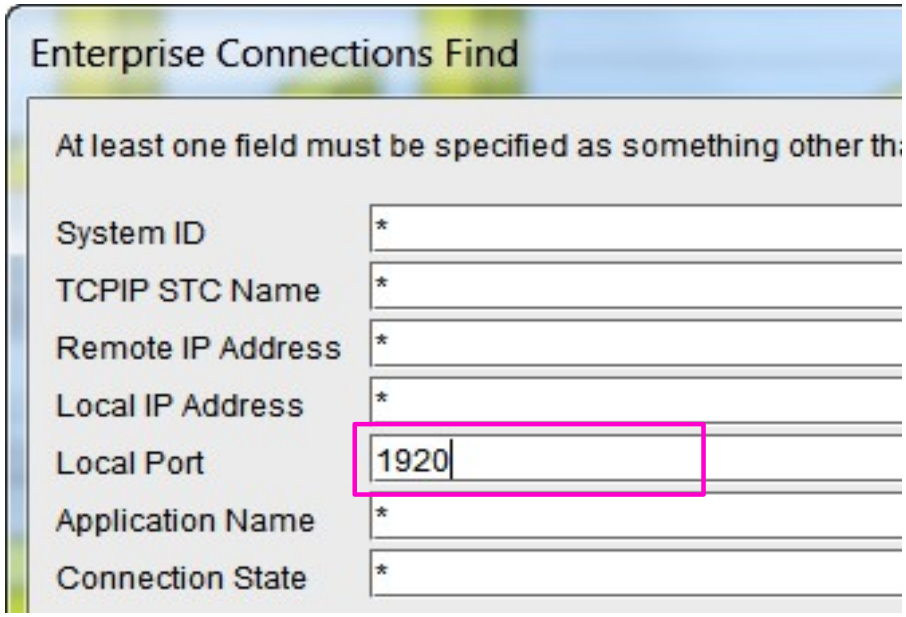


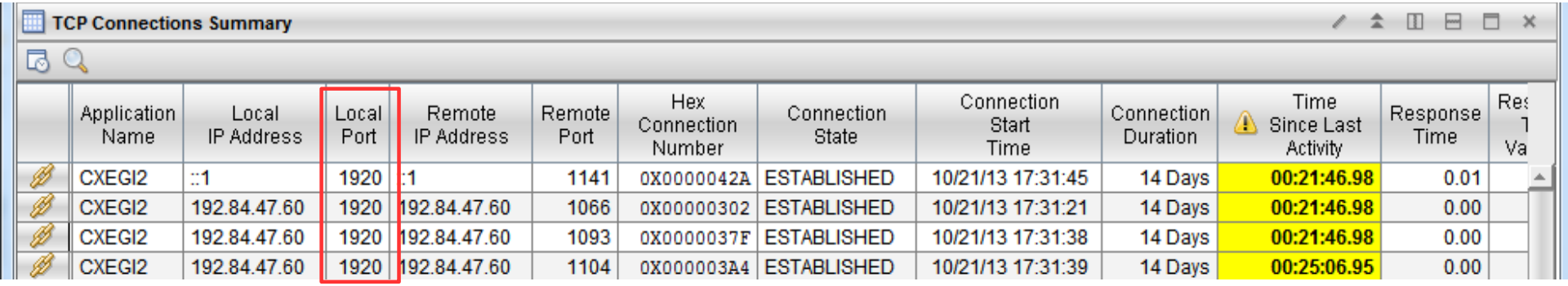
Origin Node	Application Name	Foreign IP Address	Foreign Port	Local Port	Connection State	Byte Rate	Response Time	Segments Retransmitted	Total Segments Retransmitted	Percent Segments Retransmitted	Hex Connection Number
TCPIP:MVSA	DSNADIST	9.145.100.110	41083	4462	ESTABLISHED	0	1.76	0	0	0	0X0155...
TCPIP:MVSA	DSNADIST	9.145.100.110	41077	4462	ESTABLISHED	0	1.77	0	0	0	0X0154...
TCPIP:MVSA	TN3270	9.145.100.110	57733	23	ESTABLISHED	0	2.06	0	0	0	0X0153...

OMEGAMON for MFN Enterprise_Networks FIND



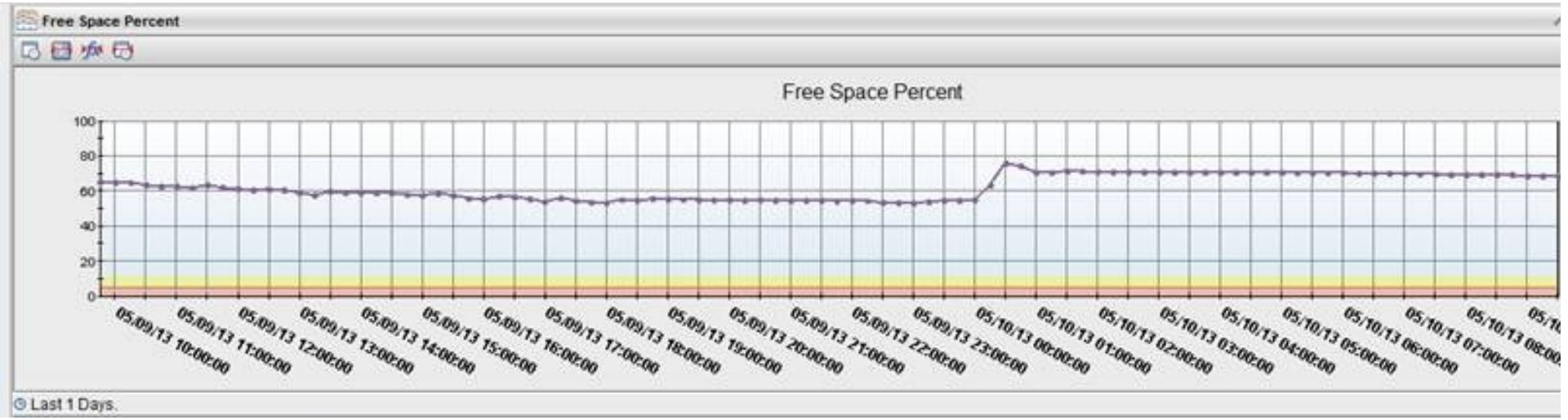
New with Version 5.1.1





Displays performance metrics for connections matching search criteria specified by the end user. Try all Connections on port 1920 on all LPAR

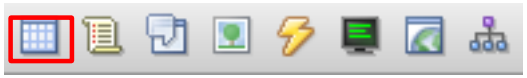
SMS Storage Group Trend FIND



	Recording Time	Group Name	Free Space Percent	Used Space Percent	Total Volumes	Low Volume Free Space %	Free Space Cylinders	Free Space Tracks	Largest Free Extent Cylinders	Total Space Cylinders	Total Space Tracks	High Volume Fragmentation Index
	05/09/13 09:45:07	GENERAL	65.3	34.7	9	62.7	171085	2568625	20873	272097	4081455	72
	05/09/13 10:00:07	GENERAL	65.1	34.9	9	62.7	170649	2562145	20873	272097	4081455	73
	05/09/13 10:15:07	GENERAL	64.7	35.3	9	62.6	169467	2544469	20873	272097	4081455	68
	05/09/13 10:30:07	GENERAL	63.3	36.7	9	62.5	165742	2488742	20245	272097	4081455	68
	05/09/13 10:45:07	GENERAL	62.9	37.1	9	62.1	164839	2475232	20245	272097	4081455	69

Cross Enterprise Wildcard FINDs – 1 of 2 Create Target

1

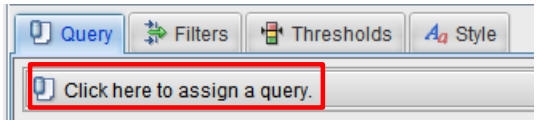


Create Table View as Target for Link

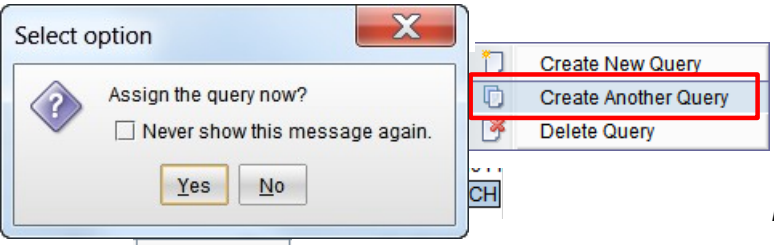
2

Select Properties or Assign the query now

3



Click here to assign query

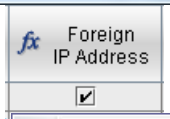


Create Another Query

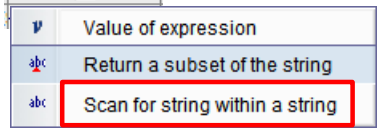
Enter new Query name

Select Field to Find on

6

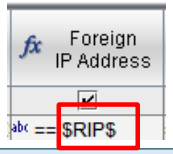


7



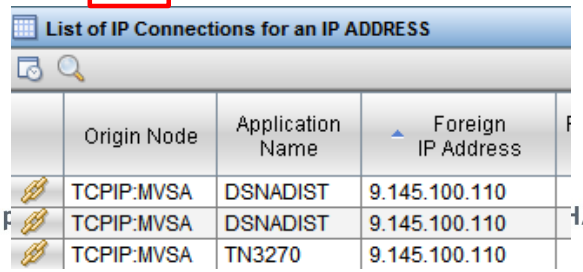
Click on "v" and select Scan

8



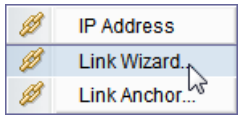
Enter Variable to shop up in Link wizard: RIP

9



Target workspace from Find

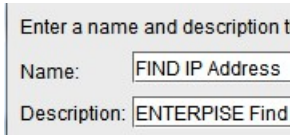
Cross Enterprise Wildcard FINDs – 2 of 2 Create Link

1. 

Link Wizard

2. 

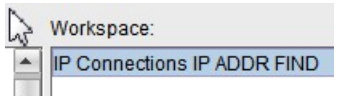
Create new link

3. 

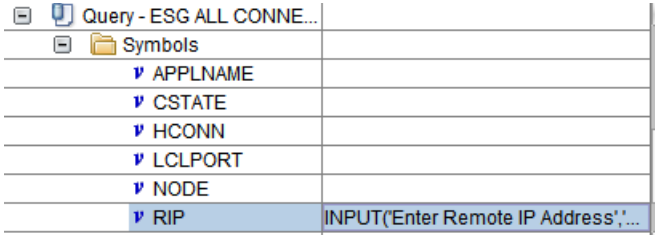
Name of new Link

4. 

Absolute Link

5. 

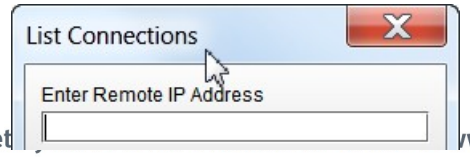
Select Target Workspace of Link (created previously)

6. 

Link Function to prompt for INPUT

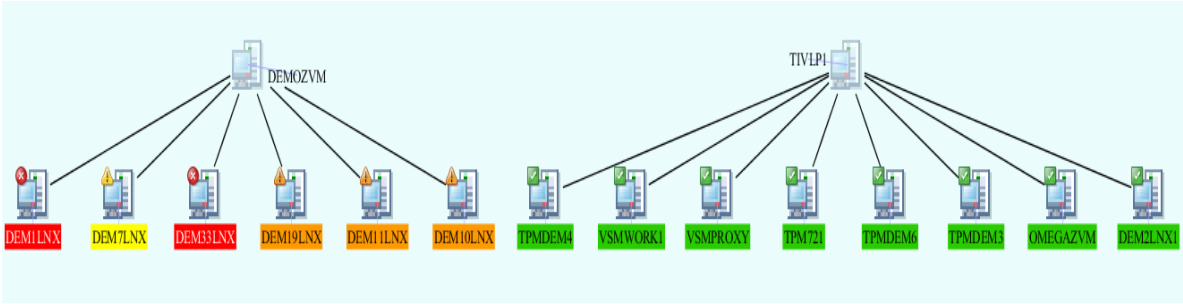
7. 

INPUT('Enter Remote IP Address')

8. 

Evaluate

Topology

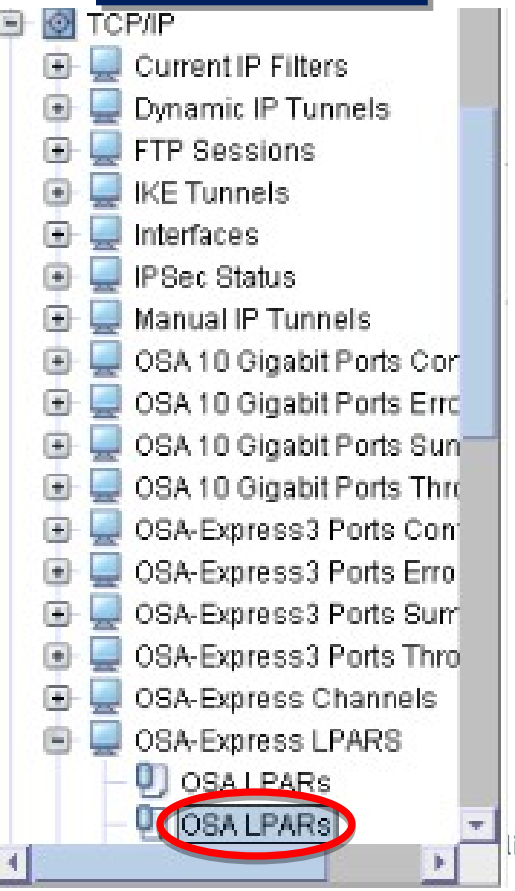


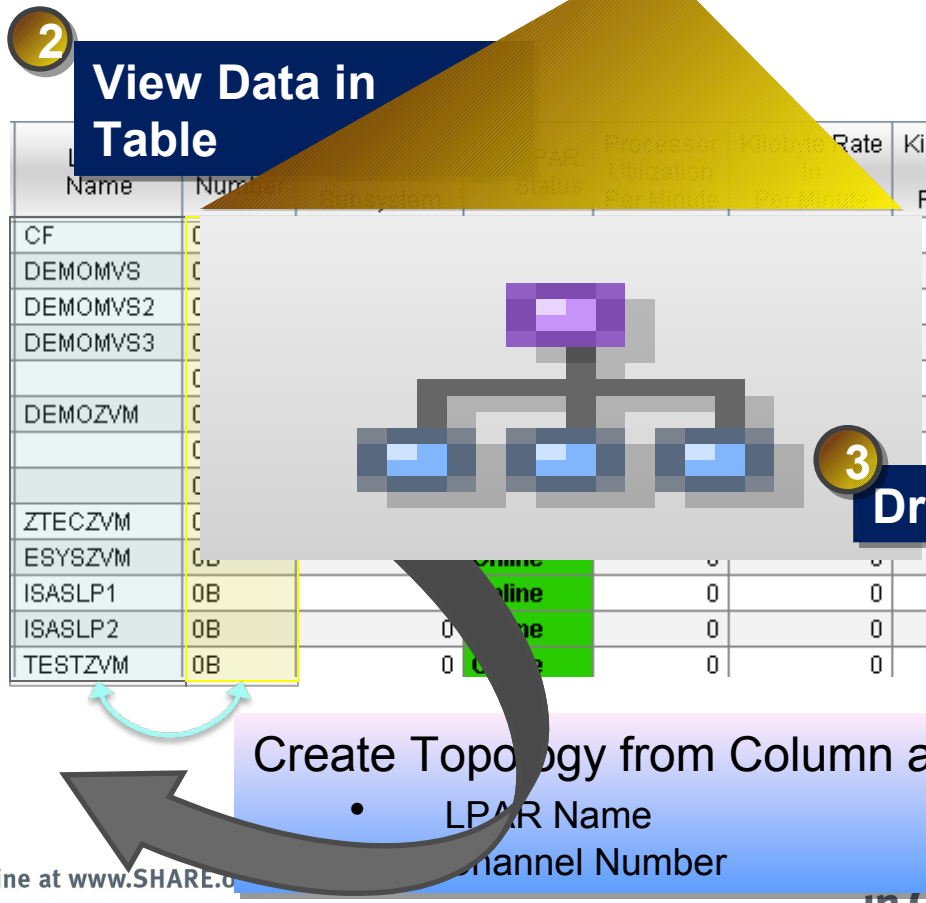
- Show relationships
  - LPARs to OSA-Express Adapters
  - z/VM to Linux Servers
  - IP Addresses to Applications
- Dynamic query based view
- Filter to limit topology size
  - By utilization or status
- Thresholds Highlight issues
- Flyover pop-ups

Example of Creating your own Topology

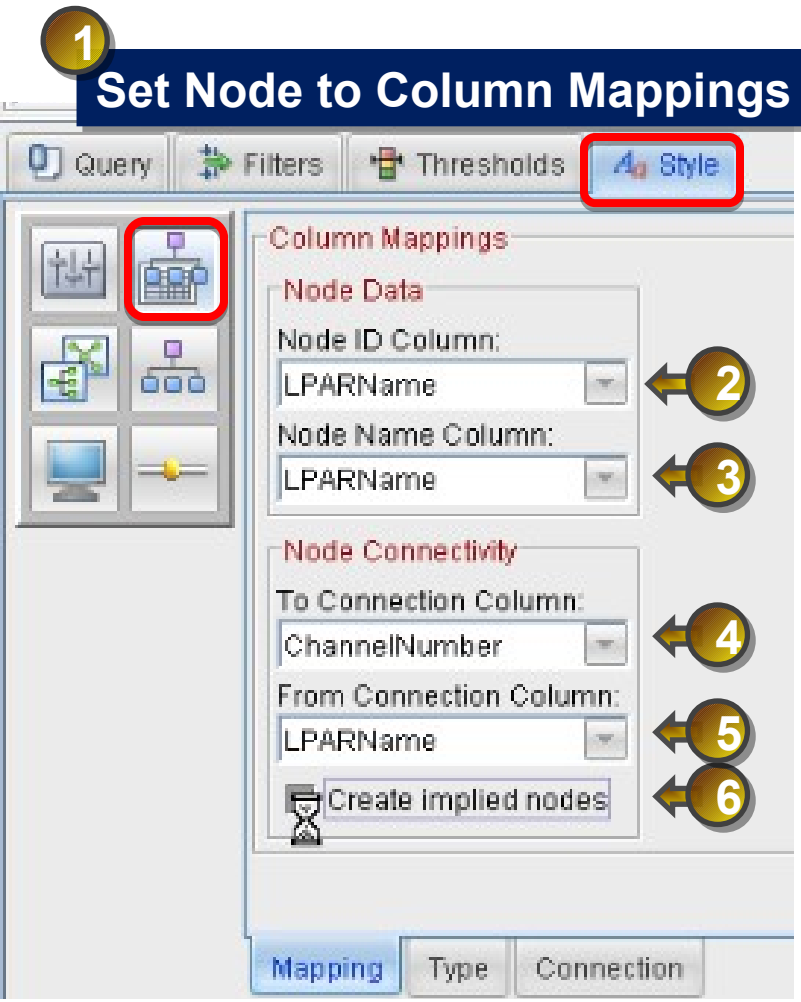
Example: a Dynamic Topology of OSA-Express connected LPARS

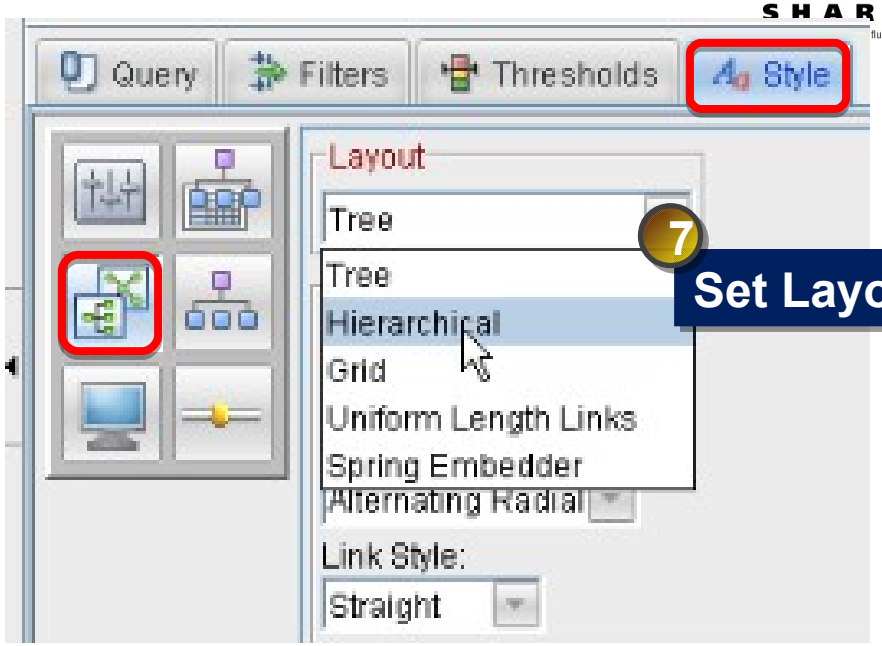
- Leverages OMEGAMON XE for Mainframe Networks
  - OSA-Express LPARs Query

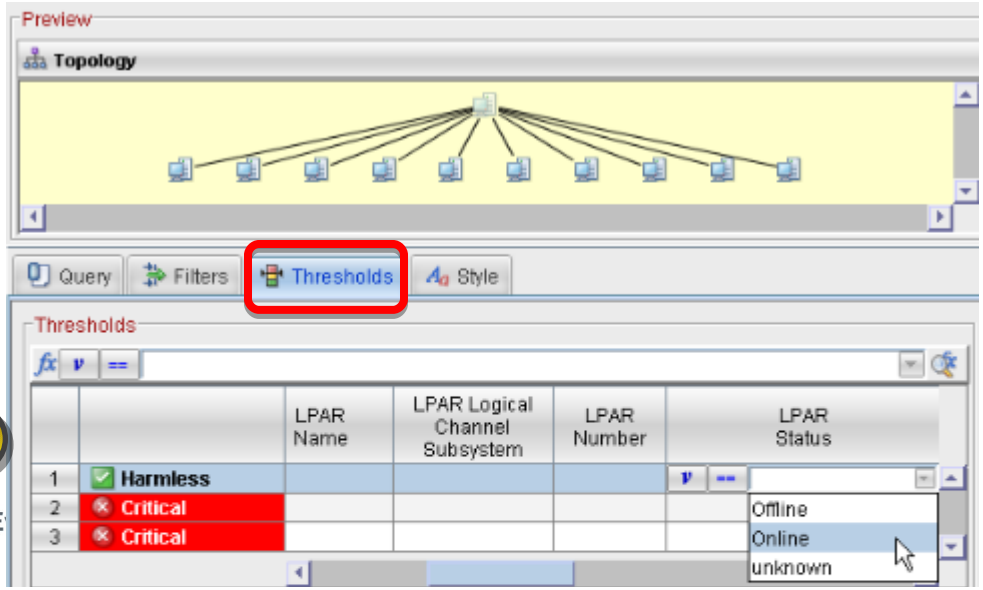




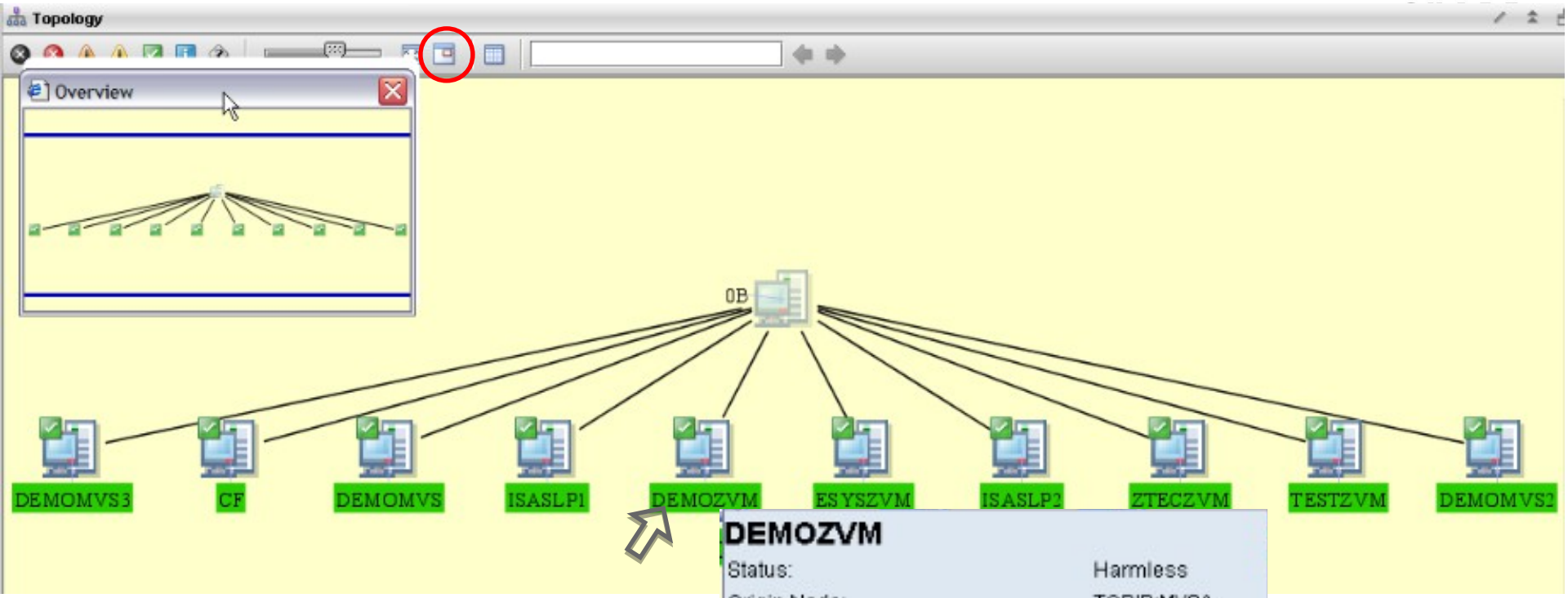
Customize Topology Properties







OSA-Express Dynamic Topology View



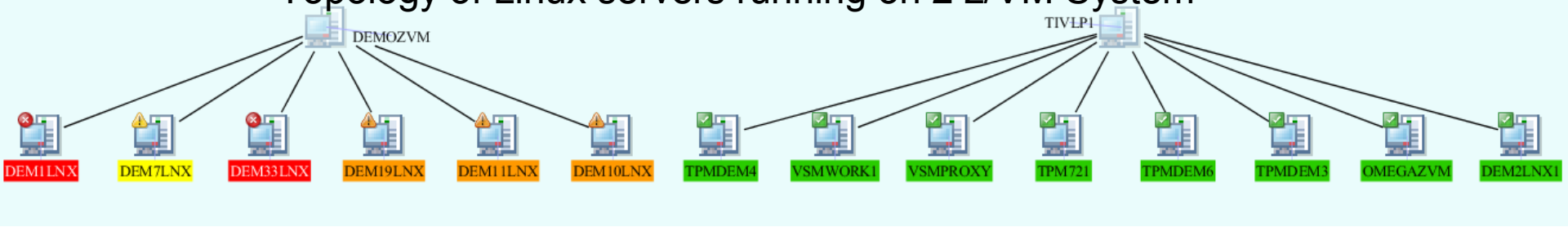
DEMOZVM

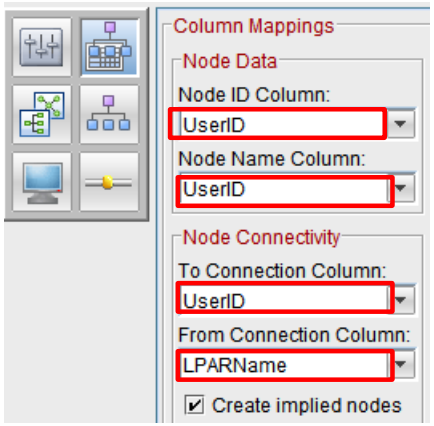
Status:	Harmless
Origin Node:	TCPIP:MVSA
Collection Time:	12/28/10 09:06:21
LPAR Name:	DEMOZVM
LPAR Logical Channel Subsystem:	0
LPAR Number:	6
LPAR Status:	Online
Processor Utilization Per Minute:	0
Kilobyte Rate In Per Minute:	0
Kilobyte Rate Out Per Minute:	0
Processor Utilization Per Five Minutes:	0
Kilobyte Rate In Per Five Minutes:	0
Kilobyte Rate Out Per Five Minutes:	0
Processor Utilization Per Hour:	0

- Mouse popup box shows current data
- Topology is dynamic as data changes
- Can set to timed Auto-refresh
- Colors set by Threshold tab

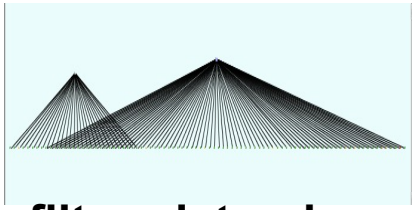
z/VM and Linux Dynamic Topology

Topology of Linux servers running on 2 z/VM System

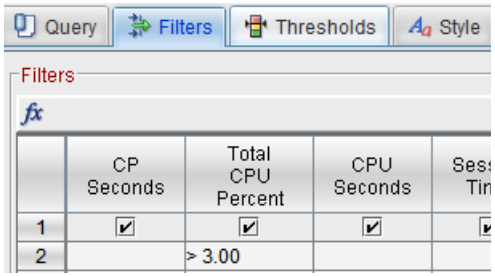




Define Topology



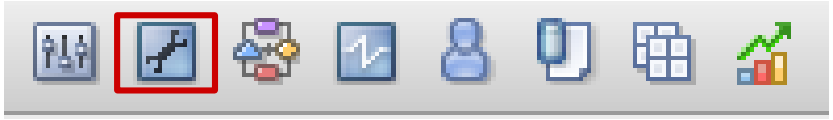
Unfiltered too busy

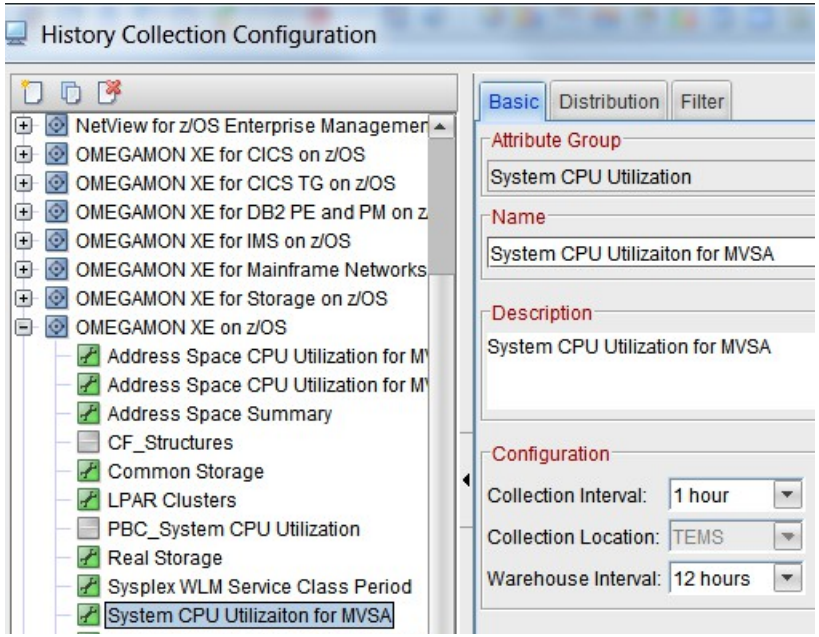


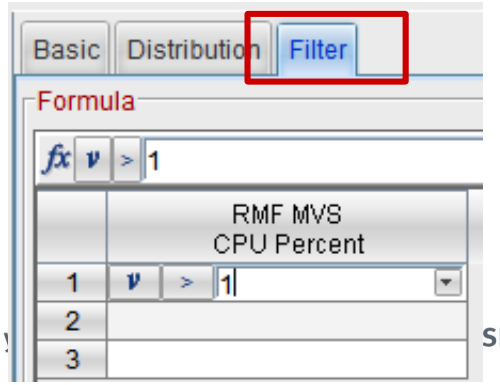
Filter out idle Servers

- Topology showing which z/VM each of Linux Server is running on
  - From OMEGAMON on z/VM and Linux workload query
- Filter-out idle Linux systems in large environments
- Highlight problem servers with setting thresholds
  - CPU, paging, Storage

OMEGAMON History







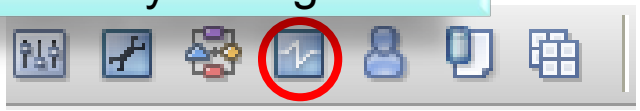
- **Configure History**
- Requires TEP ID Authorization

- **Create History Collection**
- **< 24 hours**
  - z/OS Persistent Datastores
- **> 24 hours**
  - TDW(Tivoli data Warehouse)

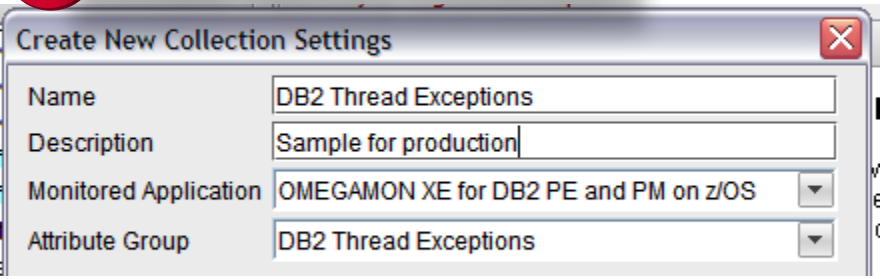
- **History Filter**
- Reduce about of history
- Filter out unnecessary history

Filtered History

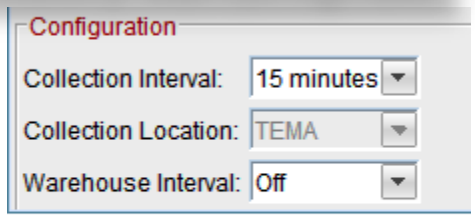
1 Launch History Configuration



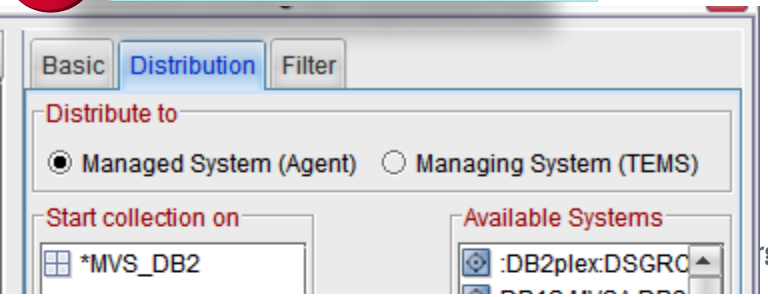
2 Create History Collection



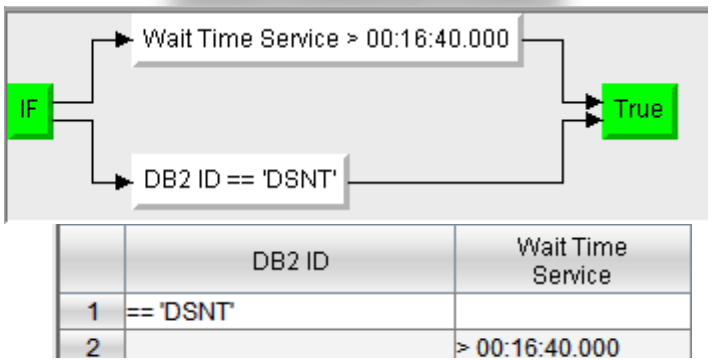
3 History Sampling rate



4 Distribute to systems

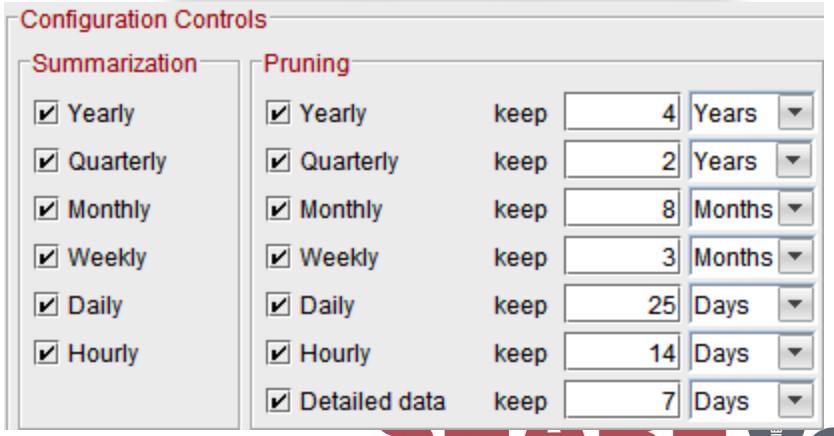


5 Set History Filter

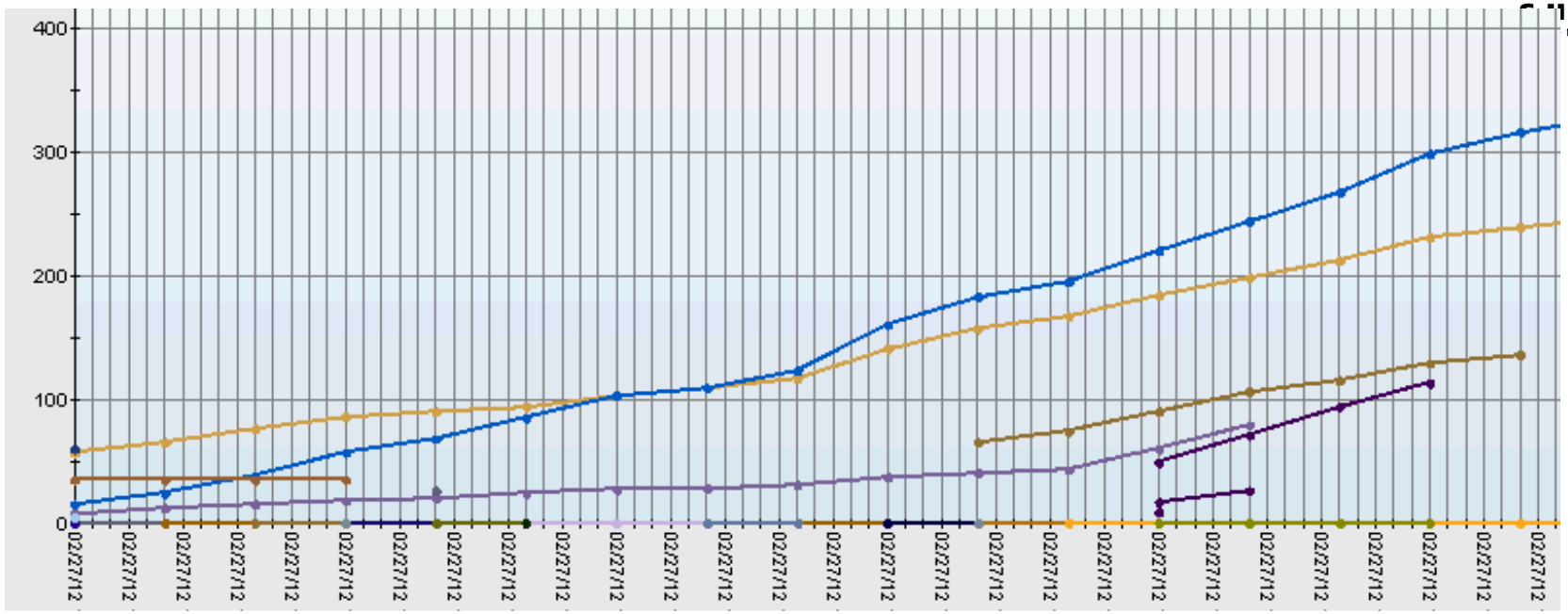


	DB2 ID	Wait Time Service
1	== 'DSNT'	
2		> 00:16:40.000

6 How long to keep history

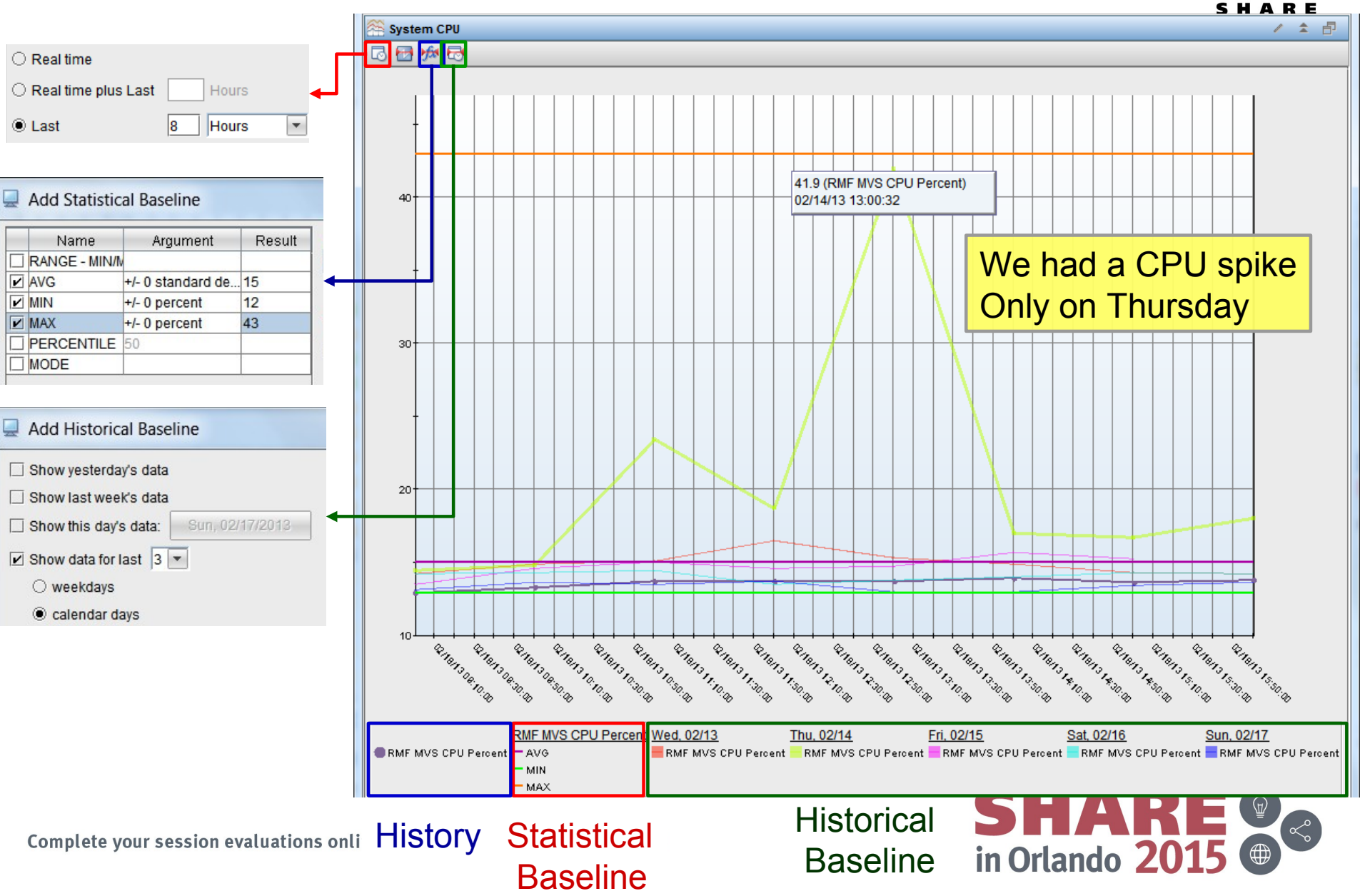


Shooting Start plot graph



- Visually see problem threads
- Filtered history in a plot chart
- DB2 Threads by CPU time
- The Steeper the line the more quickly the thread is using CPU
- The longer the line the longer it has been running

Historical and Statistical Baselines

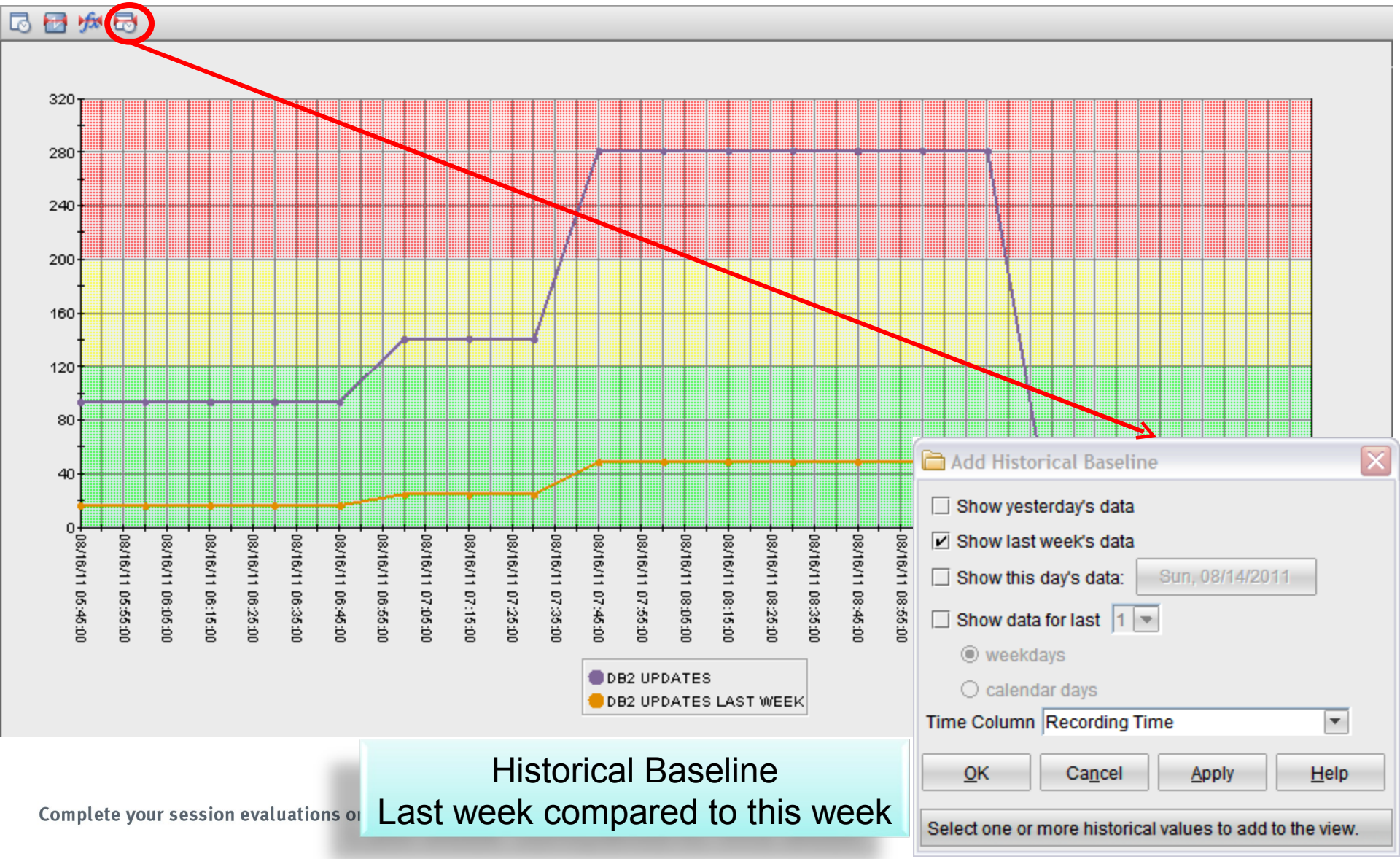


History

Statistical Baseline

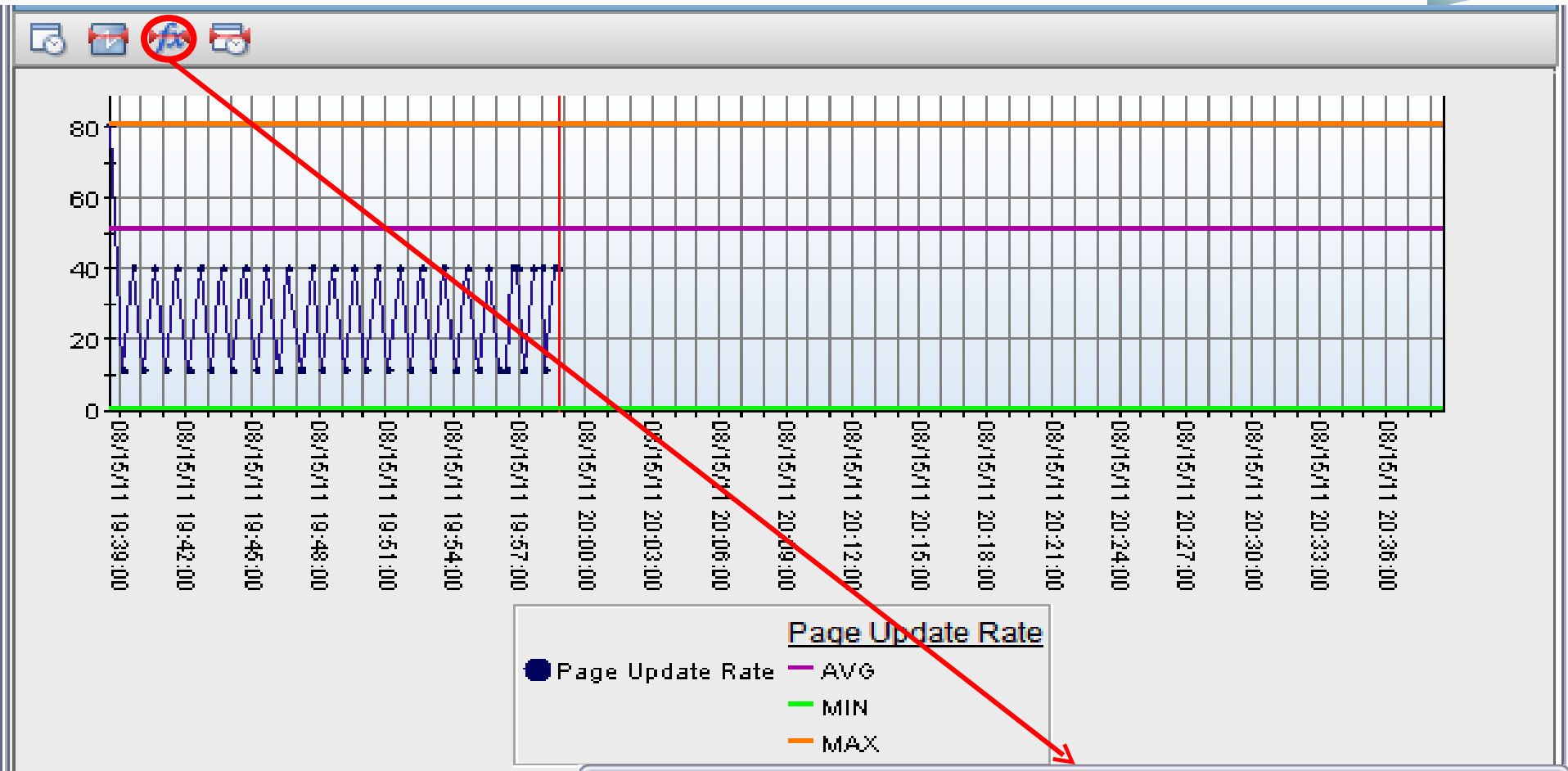
Historical Baseline

Historical Baseline Today vs Yesterday

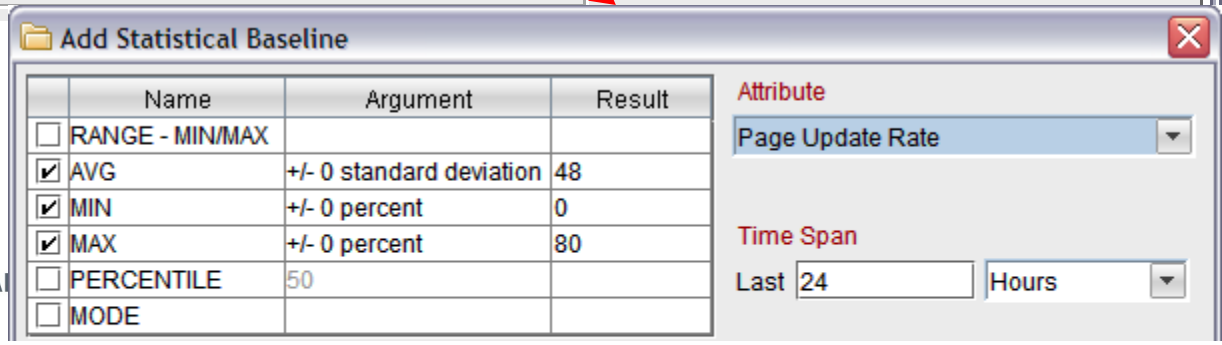


Historical Baseline
Last week compared to this week

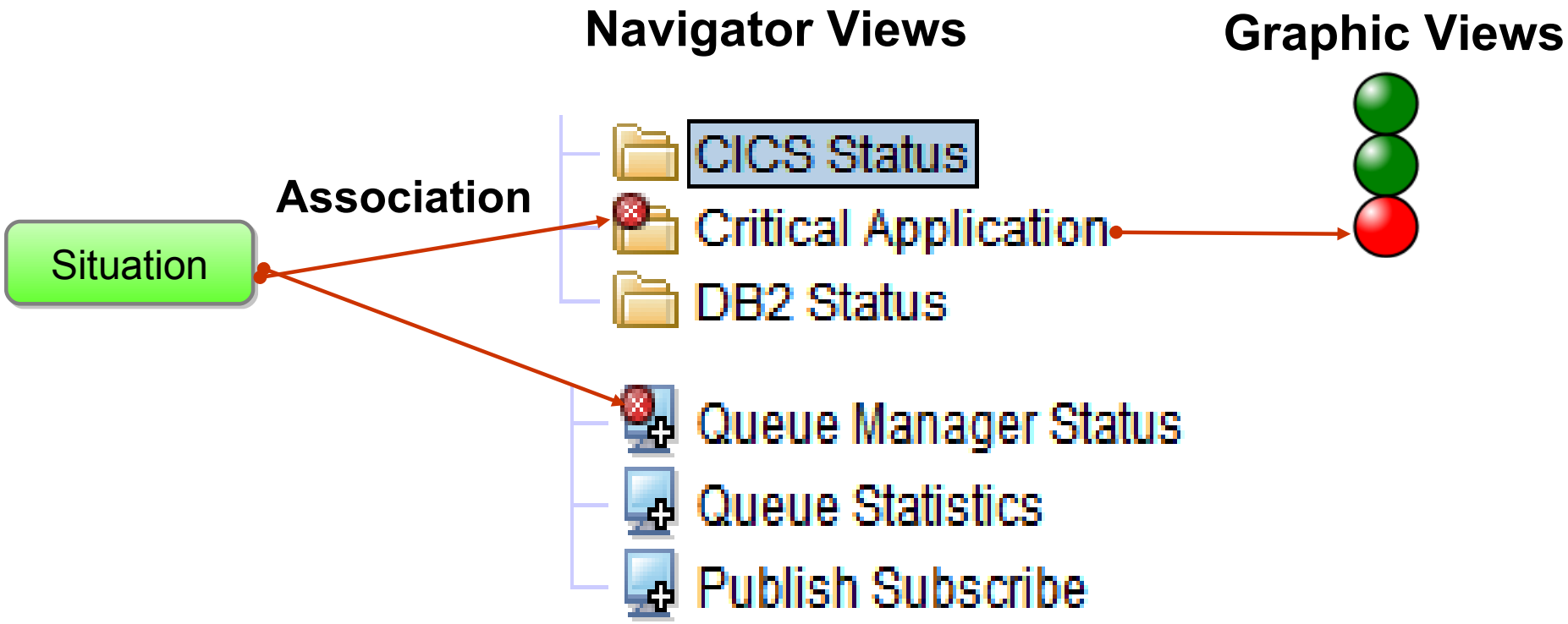
Statistical Baseline Example



Statistical Baseline (average over time)



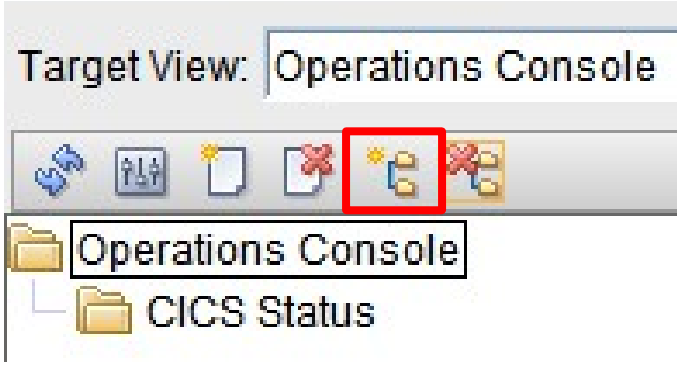
Situation Association



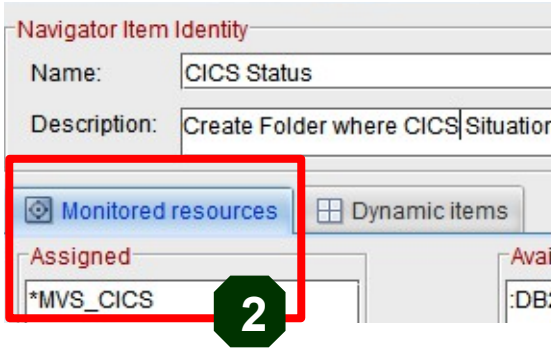
- Alert on simple or complex conditions
- Associate in custom navigator view
  - Control who sees them, how they see them
  - Copy into Graphic View

Create Navigator Views folders for situation Dots

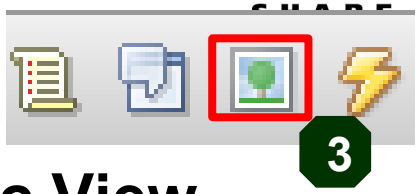
1 Create Folders in Navigator View



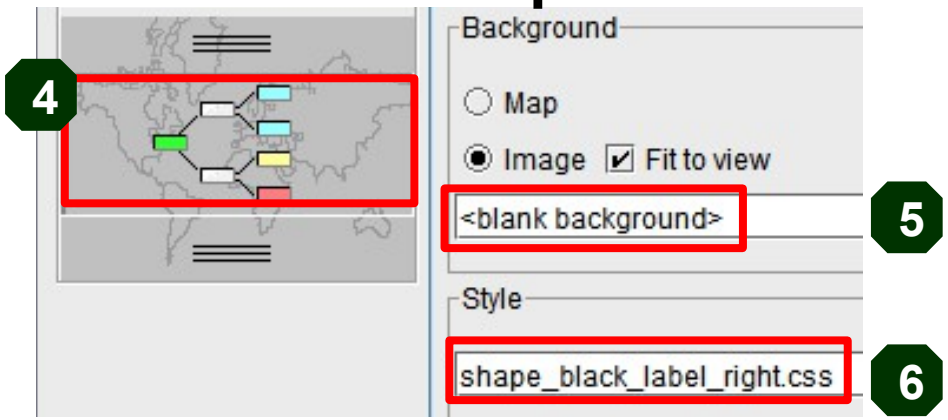
Assign Monitored Resources to be associated



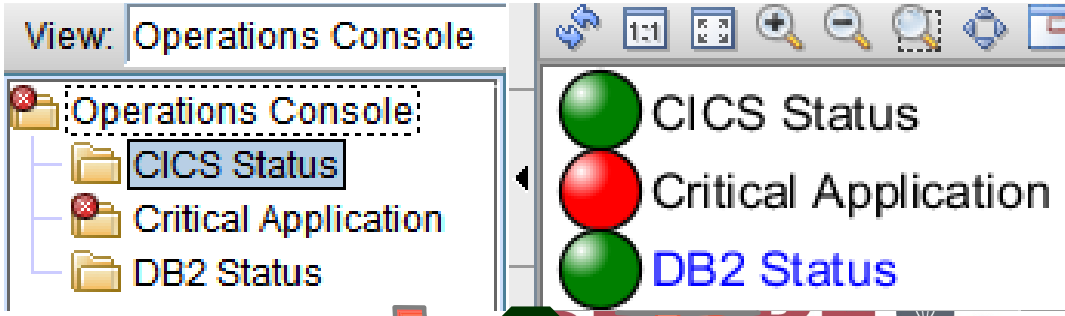
Select Graphic View



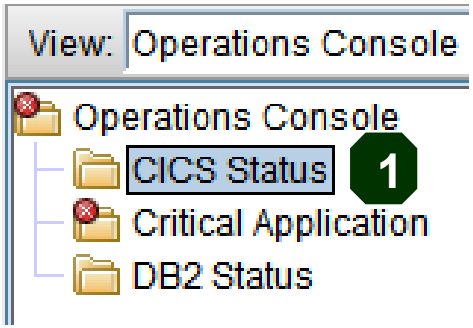
Customize Graphic View

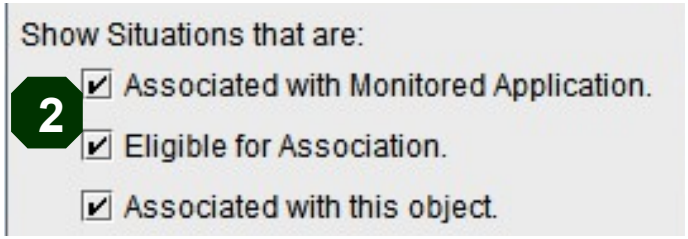


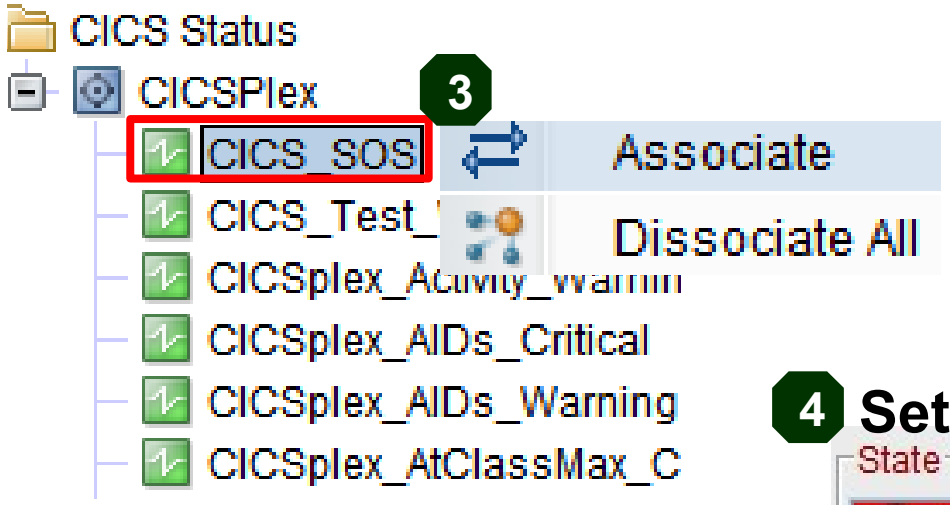
Drag and Drop folders onto graphic view



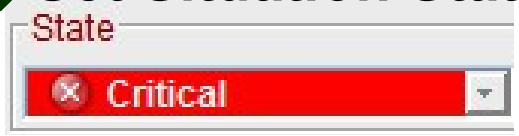
Associating Situations to Navigator Views



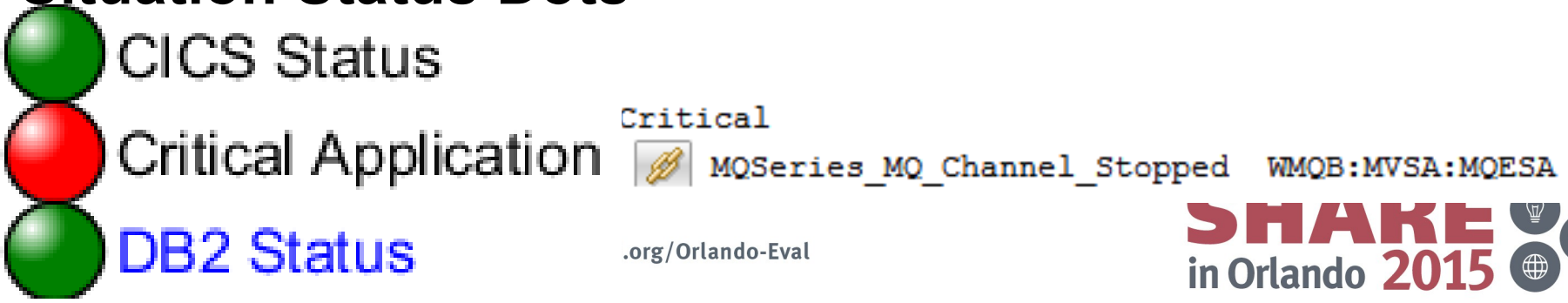




4 **Set Situation State**



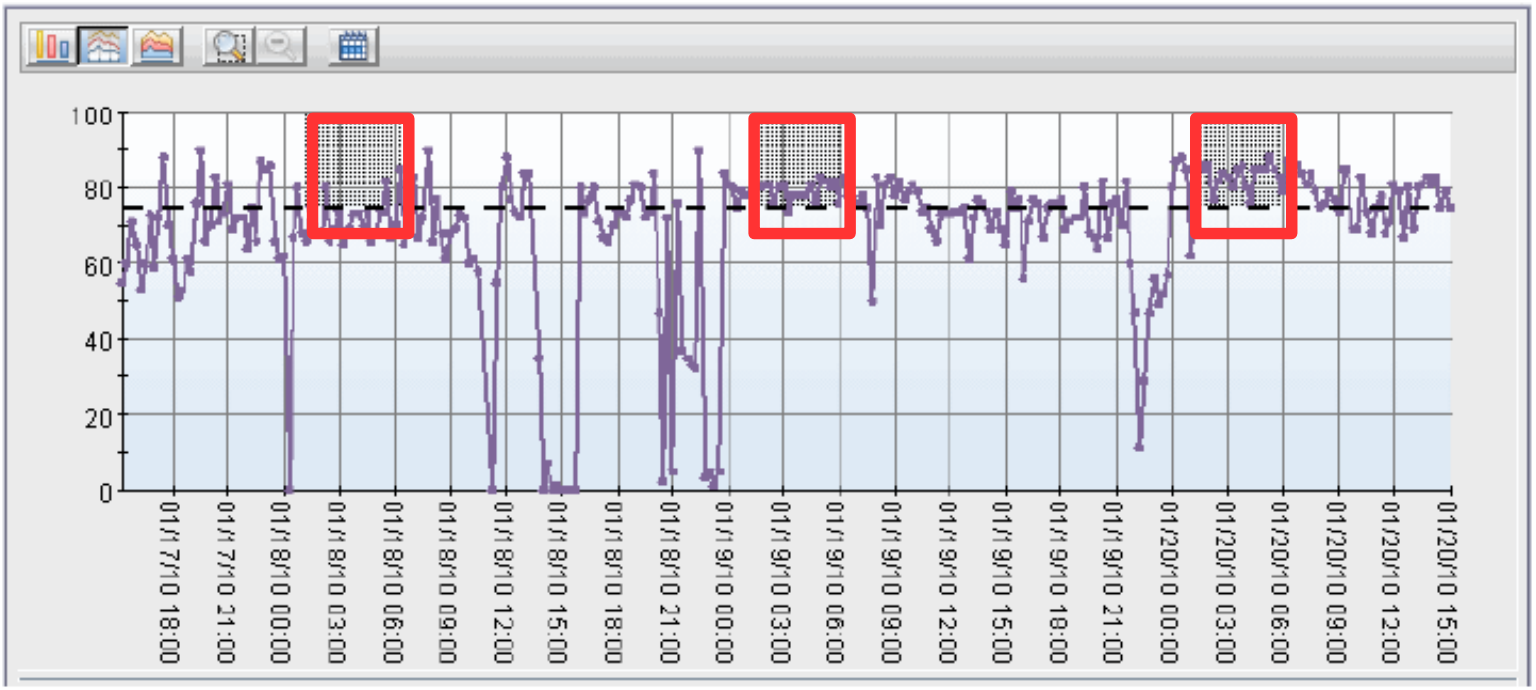
5 **Situation Status Dots**



Situation Overrides

- The need to set different thresholds by **Schedule** or Attributes
- Situations have a formula limit that can force multiple situations
- Situation Override dramatically increases formula limit to 4K

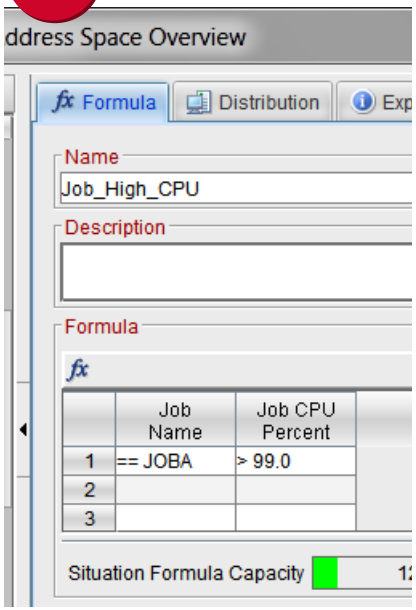
This example shows a daily schedule over three days that applies the override >= 75 from 01:00 to 06:00.



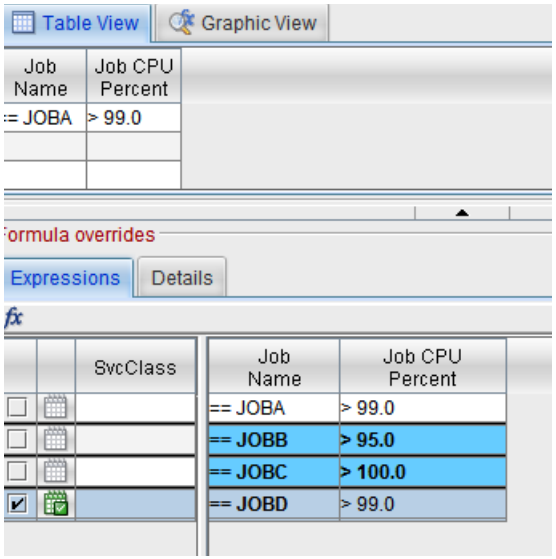
***See ITM TEP User's Guide for Details and Limitations

Situation Overrides

1 Create Situation



2 Select Distribution Assigned System

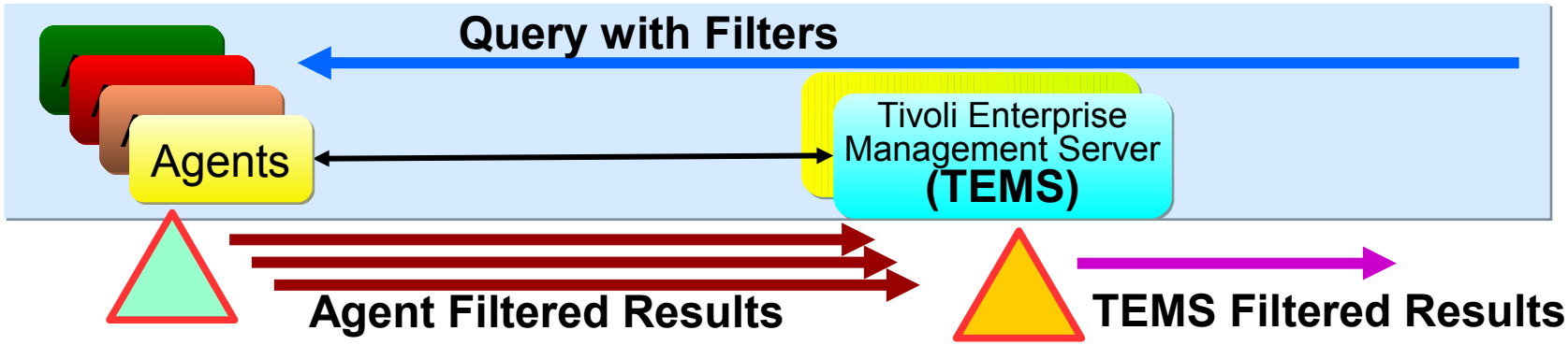


3 Override Formula

4 Add Overrides

Sitworld: ITM Situation Audit tool

- Dramatically Improve Performance of Situations
- Identify situations that would never trigger correctly
- Produces report of warning messages for static situation issues.
- Such as **TEMS** filtering instead of **Agent** query filtering
  - If query is too big, filters **not sent to agent!**
  - Distribute by Managed System Groups to help limit size

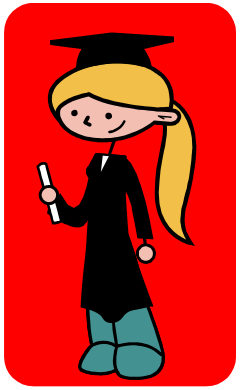


Visit Blog to ***DOWNLOAD***, see other audit tools or request for audit report assistance
Google: ***Sitworld*** *(*Blog created by John Alvord from IBM ITM L2)

https://www.ibm.com/developerworks/community/blogs/jalvord/entry/sitword_table_of_contents?lang=en

Approaches to Enterprise-Wide Monitoring

- ✓ Overview
- ✓ Enterprise Views
- ✓ Mashups
- ✓ Enterprise Wildcard FINDs
- ✓ Topology Views
- ✓ Leveraging History
- ✓ Dots Health View
- ✓ Situations overrides
- ✓ Situation Audit tool



Session 17728

Ernie Gilman, IBM Sr. Consulting IT Specialist

egilman@us.ibm.com

Additional SHARE OMEGAMON sessions

- 17708 **Filling In the IT Systems Management White Space Gap** - Ed Woods, Tuesday, August 11: 10:00 AM-11:00 AM Asia 2
- 17527 **Managing z/VM & Linux Performance Best Practices** – Mike Sine Tuesday, August 11: 3:15 PM-4:15 PM Americas Seminar
- 17474 Managing a z/VM and Linux on z Systems Environment Using IBM Solutions - **Hands-on Lab** Tuesday, August 11: 4:30 PM-5:30 PM Asia 5
- 17536: **Identify z/OS Networking Issues without Tracing** - Ernie Gilman & Dean Butler Wednesday, August 12: 1:45 Southern Hemisphere 5
- 17584 **OMEGAMON V5 Enhanced 3270 Hands-on Lab** Wednesday, August 12: 4:30 PM-5:30 PM Asia 5
- 17548 **OMEGAMON XE for Storage and RMM Reporting** -Vickie Dault Thursday, August 13: 8:30 AM-9:30 AM Europe 3

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