



IBM Software Group

Understanding the Impact of Networks on DB2 and IMS Performance

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 Tivoli software



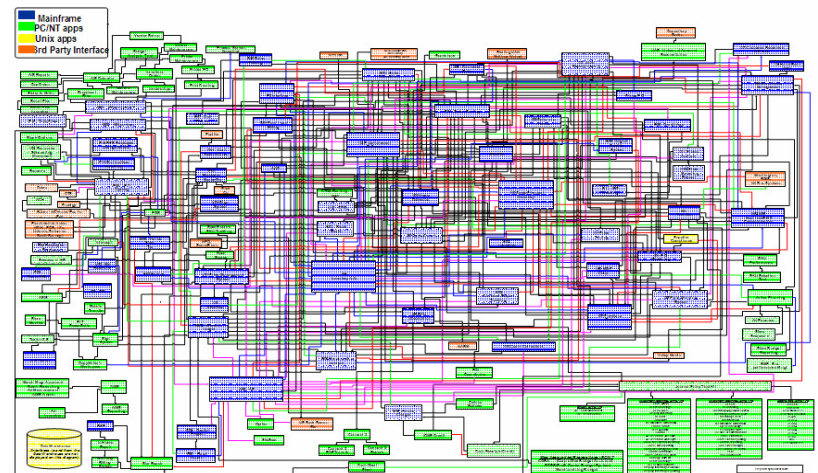
Agenda

- Challenges In Performance And Availability Management
- Understanding the application time line
- Benefits of the Tivoli Enterprise Portal
- OMEGAMON XE For DB2 PM/PE
- OMEGAMON XE For IMS
- OMEGAMON XE For Mainframe Networks & NetView
- Creating an integrated view
- Integrated navigation and linking
- Integrated alerts and corrective actions

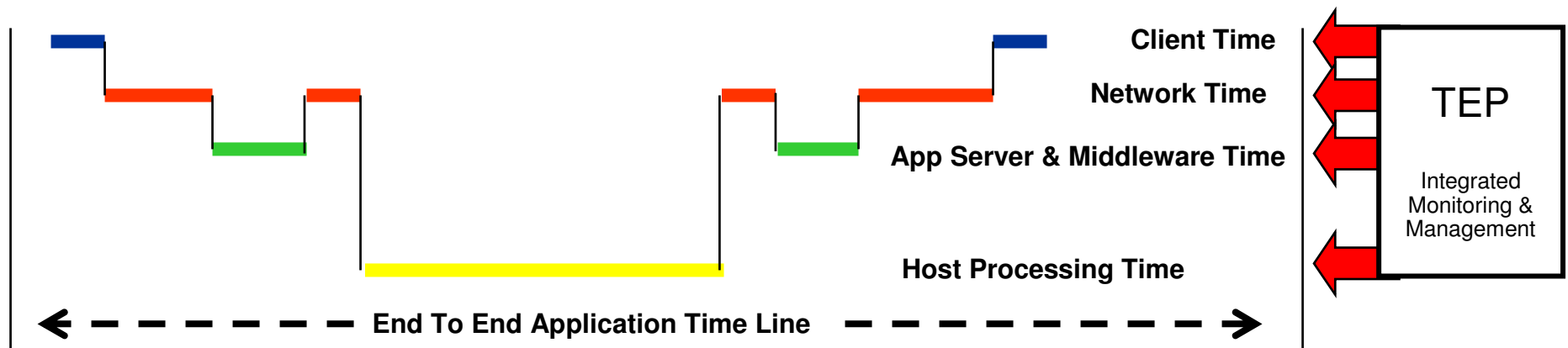


The Challenges Of Performance And Availability Management Of Complex Systems

- Most new applications are composite by design
 - ▶ Applications cross multiple subsystems and platforms
 - ▶ Integration and utilization of multiple core technologies
 - ▶ Pose challenges from a management and monitoring perspective
- Common Technical Challenges
 - ▶ Multiple platforms
 - ▶ Potentially multiple DB systems
 - ▶ Middleware considerations
 - ▶ One or multiple network hops
 - ▶ How best to do alerting, problem isolation, and root cause analysis



The Network And The Application Time Line

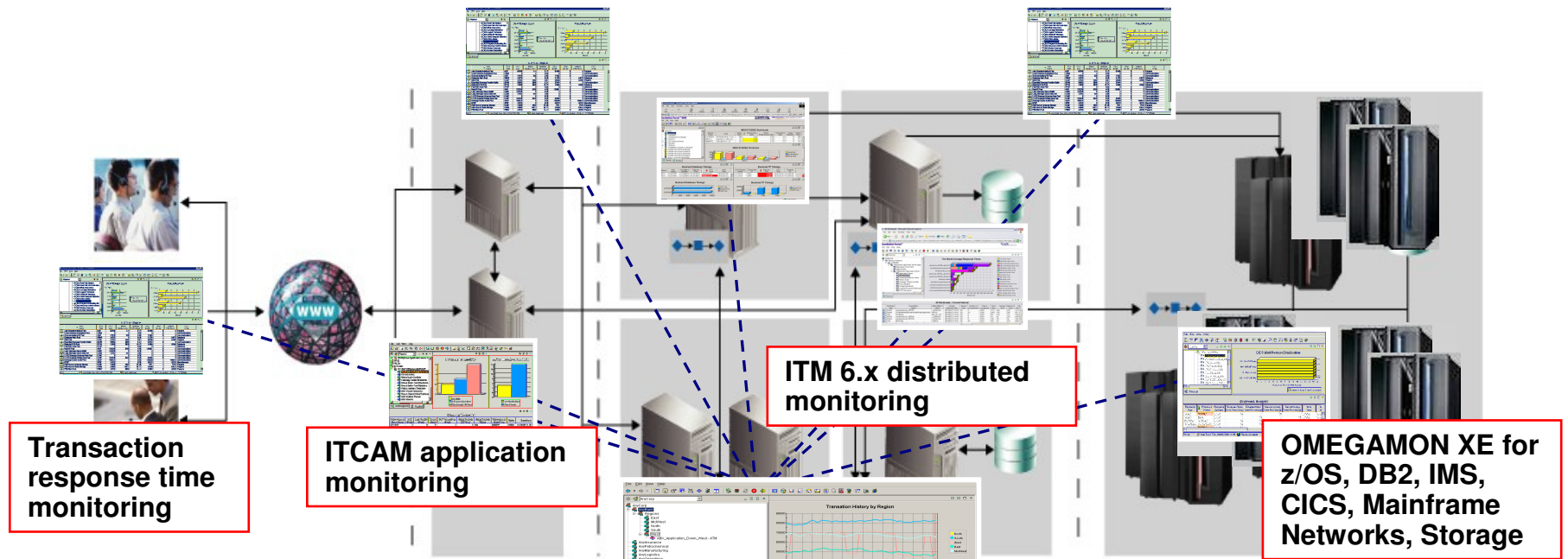


- Portions of response time may reside in any of the following
 - ▶ End user client processing, the application server or middleware level, the database, or other aspects of host z/OS application processing
- An integrated monitoring methodology enhances the ability to determine the impact of the network on the application time line
 - ▶ Monitor in depth using OMEGAMON and NetView on the mainframe, ITCAM in the middleware and application level, and ITM 6.x on the distributed level
 - ▶ Integrate monitoring and management using the Tivoli Enterprise Portal (TEP)

Where is the bottleneck?



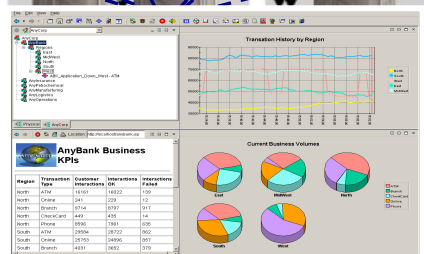
Use The Tivoli Enterprise Portal (TEP) To Integrate Essential Performance Information



Exploit the unique capabilities of the TEP to make monitoring more powerful

Tivoli Enterprise Portal (TEP)

TEP is a common user interface for a variety of Tivoli monitoring and management solutions



Benefits Of An Integrated End To End Management Approach Using The TEP

- Provide the ability to add network performance and availability information to core OMEGAMON DB2 and IMS management displays
 - ▶ Provides a more complete view of performance
 - ▶ Is the problem in the network or somewhere else?
- Improved ability to manage composite applications
 - ▶ Integrated view of subsystems, platforms, and applications
- Reduce time to problem resolution
 - ▶ Improved event and problem isolation
 - ▶ Identify and isolate issues more rapidly
 - ▶ Superior performance analysis capabilities



Integration – The Power Of The Portal

TEP Provides An Integrated Management Paradigm

Exploit the TEP & Dashboard Edition To Integrate Multiple Monitoring Technologies

Icons for alerts and drill down

User Definable Navigation

Graphic Overview

Graphics & charting

Tabular detail from a variety of sources

IMSID	RTA Group Name	Input Queue Time (Secs.)	Program Input Queue Time (Secs.)
IMSA	SYSTEM	0.0058	0.0000
IMSA	OTHER	0.0000	0.0000
IMSA	CLASS 1	0.0058	0.0000

Application Name	Byte Rate	Transmit Byte Rate	Receive Byte Rate
DSNADIST	2805	757	2048

Plan	Package DBRM	DB2
DSNJDBC	DSNJDBC1	DSN
DISTSERV		DSN

OMEGAMON XE For DB2 PM/PE V4.1

Major Features And Components

Real Time Thread Analysis

- ✓ Thread detail & performance
- ✓ Triggers, Procedures, & UDFs

Real Time – DB2 subsystem

- ✓ Virtual & EDM Pool analysis
 - ✓ Performance & snapshot
- ✓ Locking & Logging Analysis
- ✓ Storage Analysis

Application Trace Facility

- ✓ Detailed performance tracing

Choice Of Interfaces

- ✓ (TEP, PE GUI, 3270)

Buffer Pool Analysis (PE only)

DB2 Connect Monitoring

zIIP Engine utilization

Automation capabilities

Locking & Lock Conflicts

DB2Plex Monitoring View

- ✓ CF structure & lock analysis
- ✓ Group object analysis

Object Analysis

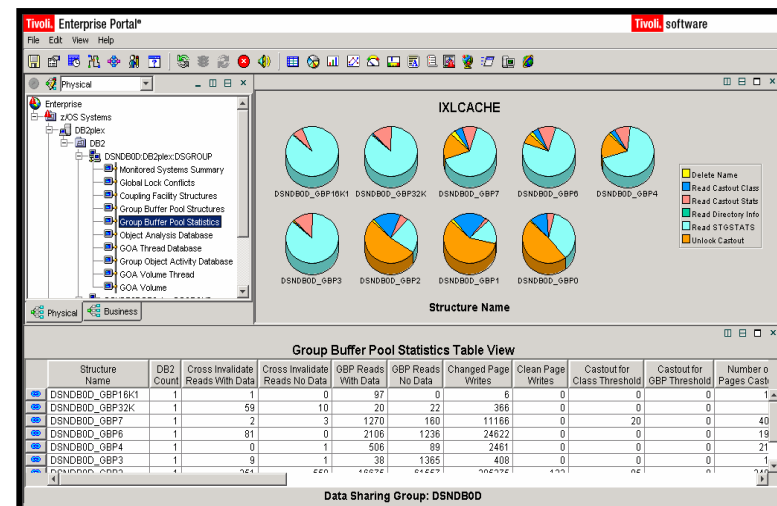
- ✓ I/O & getpage analysis
- ✓ Correlate by object & App

Near-Term Historical

- ✓ Near-term history online

Historical Analysis

- ✓ Batch reporting
- ✓ XE Tivoli Warehouse
- ✓ Snapshot History
- ✓ Performance Warehouse



Relevant Network Information Provided By OMEGAMON XE For DB2 PM/PE

- At the DB2 subsystem level
 - ▶ DDF status and DDF address space CPU rate
 - ▶ Send/receive counts and rates for transactions, SQL calls, and number of data rows
 - ▶ Number of distributed threads, inactive distributed threads, and thread high water mark
- DB2 Connect gateway performance
 - ▶ Detail about host time, time in DB2 Connect gateway, and time in network
- Application thread level
 - ▶ Transactions, bytes, messages, and blocks sent and received
 - ▶ Thread TCP/IP address and workstation name

The Challenge

There are various techniques and topologies for applications to connect to DB2
How to measure and assess network impact on DB2 workload regardless of topology?



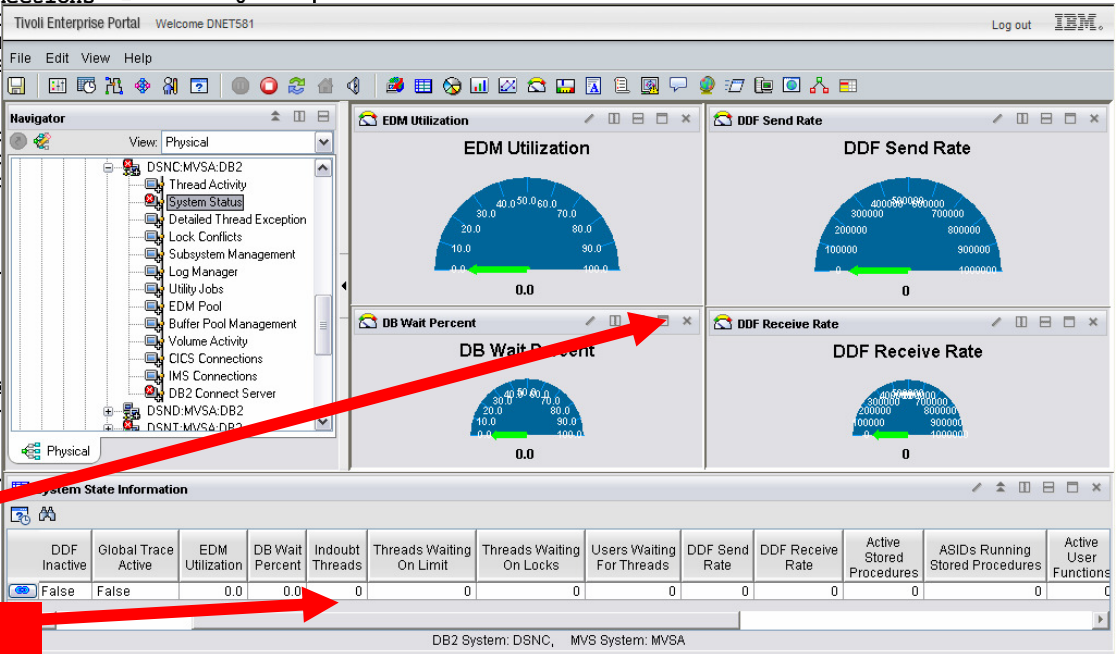
Subsystem Level DB2 Network Information

```

ZDFST  VTM  O2  V410./I DSNC 03/12/08 10:39:08 2
Help PF1  Back PF3  Up PF7  Down PF8
> D.A
> DISTRIBUTED DATA FACILITY: Enter a selection letter on the top line
> *-DDF STATISTICS  B-DDF VTAM SUMMARY  C-DDF VTAM DETAIL  H-HISTORICAL
=====
> DISTRIBUTED DATA FACILITY STATISTICS
DFST
+ Collection Interval: REALTIME          Start: 03/12 10:38:56
+ Report Interval: 11 sec                End: 03/12 10:39:08
+
+ Location Name = NDCDB203  DDF Status = ACTIVE
+ DDF CPU Rate = 00.0%      Dist Allied Threads = 0
+ Active DBATs = 7          Inactive DBATs = 0
+ DDF Send Rate = 13K/sec   DDF Receive Rate = 0K/sec
+ Resync Attempts = 0      Resync Successes = 0
+ Cold Start Connections = 0  Warm Start Connections = 0
+ DBAT Queued = 0          Conversations In Progress = 0
+ HWM All DBATs = 17       HWM Active DBATs = 0
+ Max DB Access (MAXDBAT) = 500  HWM Inactive DBATs = 0
+
+ Remote Location Name = DRDA REMOTE LOCS
+ Conversations Queued = 0  Binds for Remote = 0
+ Message Buffer Rows = 295349  Block Mode Switch = 0
+ Commits/Remote = 5        Rollbacks/Remote = 0
+ Indoubts/Remote = 0
+
+ Tran  SQL  Row Message  Byte  Commit
+-----
+ Sent   4   27  295606  108257  1088675K  0
+ Recv  226 46950  25  108253  51726859  23808
+
+ 2-PHASE COMMIT: Prepare  Last 2-Phase
+ Sent   5   4   0   0
+ Recv   5   4   0   0
    
```

To see history

Statistics for DDF activity



Message traffic (send and receive)

Thread count by type

DB2 Thread Level Performance Information

See IP address, user information, WLM service class, workstation information

Welcome DNET581
Tivoli Enterprise Portal
 File Edit View Help

DB2 Threads

Plan	Package DBRM	DB2 Subsystem	Connection Type	Collection	Thread Type	Bytes Sent	Conversations	Messages Sent	Rows Sent	SQL Calls Sent	SQL Received
DISTSERV		DSNB	DBAccess		DB Access	334	0	5	0	0	0
DSNJDBC	DSNJDBC1	DSNA	RRSAF	DSNJDBC	Unknown	0	0	0	0	0	0

V410./I DSNCL 03/12/08 10:45:02 2
 Back PF3

selection letter on the top line.

WORK WAITS D-LOCKS OWNED E-GLOBAL LOCKS
 DISTRIBUTED I-BUFFER POOL J-GROUP BP
 PARALLEL TASKS N-UTILITY O-OBJECTS
 I ACTIVITY S-APPL TRACE T-ENCLAVE

=====

THREAD DETAIL

```

+ Thread: Plan=DISTSERV Connid=SERVER Corrid=db2jcc_appli Authid=DNET581
+ Dist : Type=DATABASE ACCESS, Luwid=G94C1C2D.GB3B.C214F9B0EFE2=812813
+ Location : NDCDB203
rsum
+
+ Distributed TCP/IP Data
+Location IP Addr Port Ctbuser Srvclsnam Prod ID Workstation Name
-----
+9.76.28.45 094C1C2D 448 dnet581 DDFDEF JCC02100 IBM-1E47754C52F
+
+ Transaction name: db2jcc_application
+ TCP/IP Userid: dnet581
+
+ Distributed SQL Statistics
+
+ Remote Location Name = 9.76.28.45 Remote Location Luname = G94C1C2D
+
+ Protocol Used = Conversations Queued = 0
+ Block Mode Switches = 0 Message Buffer Rows = 6336
+ Bind Remote Access = 0 Max Allocated Conv = 0
+ Conv Allocated = 0 Conv Deallocated = 0
+ Indoubt/Remote = 0 Commit/Remote = 0
+ Rollback/Remote = 0
  
```

	Tran	SQL	Row	Message	Byte	Commit	Abort	Conv	Blocks
Sent	0	0	6336	48	554787	0	0	0	33
Recv	1	33	0	48	4468	11	0	1	0

Test 2 Phase Commit Backout

```

+ 2-PHASE COMMIT: Prepare Agent Commit Backout Forget Resp Resp
+
+ Sent 0 0 0 0 0 0 0
+ Recv 0 0 0 0 0 0 0
  
```

Thread level performance information

See distributed thread send and receive information

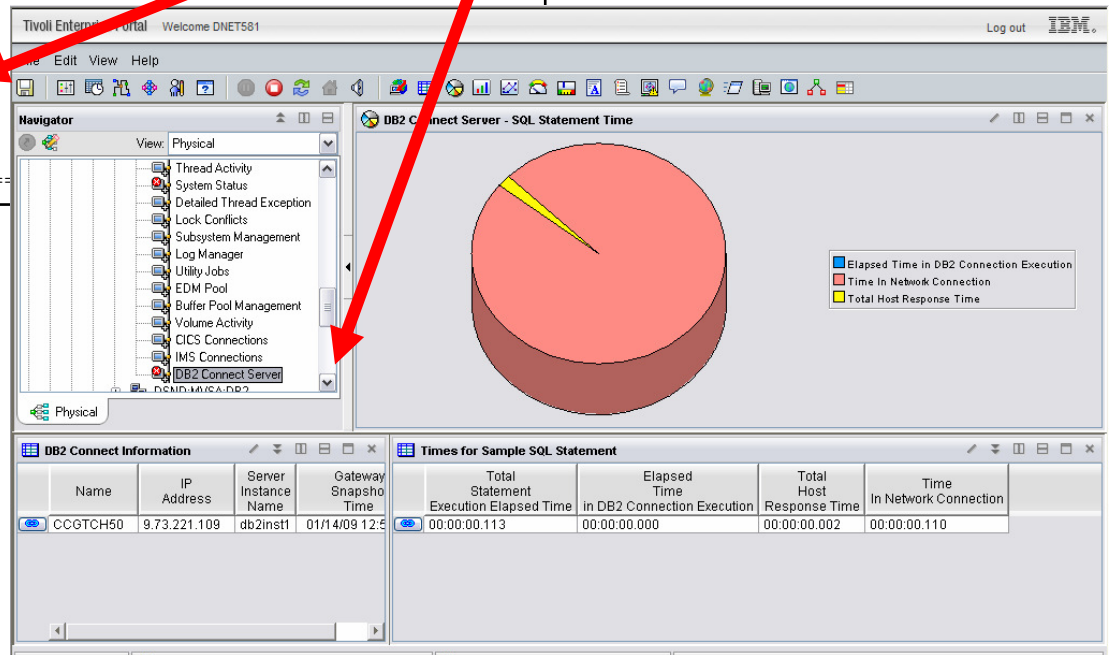
DB2 Connect Gateway Performance

```

_____ ZDBCP   VTM   O2   V410./I DSN 03/12/08 10:53:06  2
>      Help PF1   Back PF3   Up PF7   Down PF8
>
> DB2 Connect/Gateway: Enter a selection letter on the top line.
>
> A-DB2 Connect/Gateway Statistics  B-Tasks List  *-Performance
> D-Package Statistics
=====
>
>          DB2 Connect/Gateway Performance
> DBCS
+ Name: IBM-TRTL08U8STG IP Addr: 9.48.115.40   Srv Inst Name:DB2
+ Gateway Snapshot Time:2008-03-12-10.52.15.624000
  dbcp
+
+ Times for Sample SQL Statement
+ -----
+ Total Statement Time           =00:00:00.494260
+ Time in DB2 Connect           =00:00:00.000455
+ Time on DB2 Host              =00:00:00.000787
+ Time in Network Connection    =00:00:00.493018
=====
    
```

**Is the problem in the network?
Is the problem in DB2?
Is the problem in the gateway?**

DB2 Connect gateway performance data is collected via an OMEGAMON agent process installed on the Connect gateway. Performance data is forwarded to OMEGAMON task running on z/OS.



OMEGAMON XE for Mainframe Networks V4.1

Add Detailed Network Performance Information

- **Powerful monitoring and management**

- ▶ Monitor TCP/IP and SNA network resources from a common interface
- ▶ Real time and historical monitoring capabilities

- **Out of the box alerts and automation**

- ▶ Product provided situations

- **Common user interface** – Tivoli Enterprise Portal (TEP)

- ▶ Manage all z/OS resources from a single user interface.
- ▶ Display data in graphs, charts and table format

- **Easy to configure**

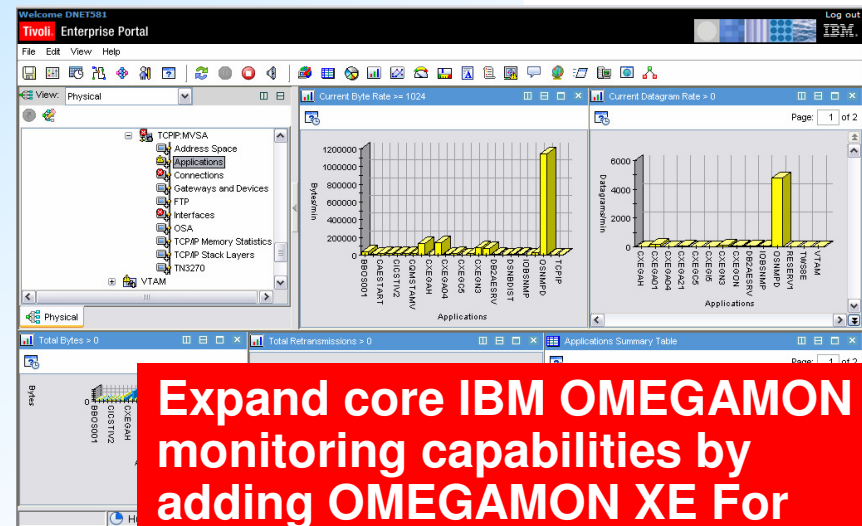
- ▶ Customize workspaces, reports, situations
- ▶ Define thresholds, Filters, Sort
- ▶ Generate Events

- **Integrated Capabilities**

- ▶ OMEGAMON integration
- ▶ NetView for z/OS V5.2 workspaces
- ▶ ITM 6.x

- **Effective**

- ▶ Determine the actual service level
- ▶ Automate responses to performance problems



Expand core IBM OMEGAMON monitoring capabilities by adding OMEGAMON XE For Mainframe Networks to the TEP



OMEGAMON XE For Mainframe Networks Provides Detail For Connection Level Monitoring

Welcome DNET581 Log out

Tivoli Enterprise Portal

File Edit View Help

Connections Summary Table

Collection Time	Application Name	Connection Type	Local Port	Foreign Socket	Hex Connection Number	Connection State	Total Bytes Received (in GB)	Total Bytes Received	Total Bytes Sent (in GB)	Total Bytes Sent	Total Bytes (in GB)	Total Bytes
06/12/06 12:01:53	DSNBDIST		4	The local port for this TCP connection.	01BD4640	5	0	18411	0	3647	0	
06/12/06 12:01:53	DSNDDIST		4466	9.19.55.136:15160	0X00000052	5	0	10824743	0	23292594	0	34
06/12/06 12:01:53	DSNDDIST		4466	9.19.55.136:18826	0X01BD4648	5	0	1204	0	688	0	

Monitor network performance of DB2 distributed connections

Will work for various DB2 connection topologies and application types

Welcome DNET581 Log out

Tivoli Enterprise Portal

File Edit View Help

Connections Summary Table

Byte Rate	Response Time	Response Time Variance	Telnet Appl Name	Telnet LU Name	Segments Retransmitted	Total Segments Retransmitted	Percent Segments Retransmitted	Datagrams Received	Datagrams Sent	Datagrams Sent or Received	Total Datagrams Received	Total Datagrams Sent	Total Datagrams	Datagram Rate
8232	0.27	0.45	The statistical variation of response times since the connection was established.				0	0	0	0	0	0	0	0
3135	0.94	0.93					0	0	0	0	0	0	0	0
0320	0.28	0.23			0	0	0	0	0	0	0	0	0	0

Integration – The Power Of The Portal Creating An Integrated Performance Workspace

- Creating an integrated performance management workspace using the TEP allows for the easy inclusion of network detail into DB2 and IMS displays
- Integration takes two primary forms
 - ▶ Integrated displays pulling together performance detail from multiple sources
 - ▶ Integrated cross product navigation using the capabilities of TEP links and dynamic workspace linking
- Integrated Situation Alerts, alert correlation, and corrective actions using the TEP
- History integrated with real time performance information



Customizing A TEP Workspace

Use Queries To Add Network Detail To The Workspace

Assign a query to control the information content of the workspace

Right click and select 'Properties'

The screenshot shows the DB2 Connect Server interface. A table titled "Network Performance Statistics" is displayed with the following data:

Application Name	Byte Rate	Transmit Byte Rate	Receive Byte Rate	Transmit Datagram Rate	Receive Datagram Rate	Datagram Rate	Transmit Segment Rate	Receive Segment Rate	Segm Rate
DSNBDIST	10480	1903	8576	0	0	0	20	20	
DSNCDIST	9494	1842	7652	0	0	0	26	16	

A context menu is open over the table, with "Properties..." selected. A red arrow points from the "Query" button in the workspace toolbar to the "Click here to assign a query." field in the Properties dialog.

If changing query create a custom query

Select a query to add network data to the workspace.

Add Connection level or Application level information

The screenshot shows the "Query Results Source" specification dialog. The "Specification" section contains the following table:

	Origin Node	Byte Rate	Collection Time	Application Name	Connection Type
1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Below the table, the formula is defined as: `(Origin Node == $NODE$ AND Byte Rate > 0)`. The "Specification" section also includes "Application Connections" and "Connection with Current Connections".

Use The Properties Options To Filter The View And To Control The Content Of Network Information Displayed

The screenshot shows the 'Properties - EW_Demo_Example' window. On the left, a tree view shows 'EW_Demo_Example' with sub-items 'Views', 'Table Views', 'DB2 Threads', 'Plot Chart Views', and 'Graphic Views'. The main area is divided into several sections:

- Preview:** A table titled 'Network Performance Statistics' with columns: Application Name, Byte Rate, Transmit Byte Rate, Receive Byte Rate, and Transmit Datagram Rate. Data rows include 'CICSTIV2' and 'DSNCDIST'.
- Query, Filters, Thresholds, Style:** A toolbar with icons for these functions.
- Filters:** A table with columns: Application Name, Byte Rate, Transmit Byte Rate, Receive Byte Rate, Transmit Datagram Rate, Receive Datagram Rate, Datagram Rate, and Tra Se f. Row 3 is highlighted with a red box and contains the filter 'abc == DSN'.
- Data Snapshot:** A table with columns: Transmit Datagram Rate, Receive Datagram Rate, Datagram Rate, and Tra Se f. It shows data for applications like 'CICSTIV2', 'CICSTIV3', and 'CQMSTAMV'.

Red callout boxes provide instructions:

- 'Select the Filters Tab.' points to the 'Filters' tab in the toolbar.
- 'Select which columns are to appear in the workspace.' points to the 'Filters' table columns.
- 'Specify which applications will be included. In this example use the substring function to filter for DB2 network connections.' points to the filter 'abc == DSN' in the 'Filters' table.

A yellow tooltip for the 'Datagram Rate' column reads: 'The number of datagrams that were transmitted, per minute, during the most recent time interval.'

Use A Similar Technique To Include DB2 Information From OMEGAMON XE For DB2 PM/PE

Specify the query and select the Filters Tab.

Select which columns are to appear in the workspace.

Specify which DB2 threads will appear on the workspace.

Use a similar process to include information on the DB2 subsystem and DB2 Connect Gateway performance

Plan	Package DBRM	DB2 Subsystem	Connection Type	Connection	DB2 Status	C
1						
2	== DISTSERV					
3	== DSNJDBC					
4						

Package DBRM	DB2 Subsystem	Connection Type	Connection	DB2 Status	C
SYSSH200	DSNB				
DSNJDBC1	DSNA				
ADHPLAN3	DSNB				
KO2PLAN	DGO@WR2C	DSNB			
KO2PLAN	DSNB				
DB2PM	DGO@PC1	DSNB			
KO2PLAN	DGO@SDOB	DSNB			

The result is an integrated DB2 performance overview display

The screenshot displays an integrated performance overview for DB2. The interface includes a navigation pane on the left with categories like CICS Performance, DB2 Performance, IMS Performance, and Windows Performance. The main area is divided into several panels:

- DB2 Subsystem Statistics:** A table showing performance metrics for subsystem D81L.
- DB2 Distributed Threads:** A table showing details for a thread named DB2BP.EXE.
- DB2 Connect Performance:** A table showing connection details for IP 9.56.123.78.
- Network Performance:** A table showing network metrics for applications D71EDIST, D81LDIST, and D91ADIST.
- Bar Chart (Bottom Left):** Compares four time-related metrics.
- Bar Chart (Bottom Right):** Compares four network-related metrics.

DB2 subsystem performance

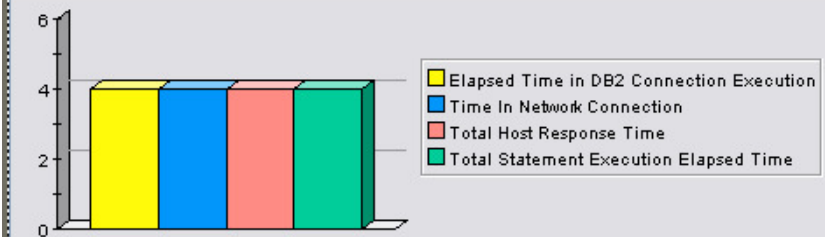
DB2 distributed thread performance

DB2 Connect performance

Network performance of DB2 connections (from OMEGAMON Mainframe Networks)

IP Address	Name	Elapsed Time DB2 Connection Executi	Total Host Response Time	Time In Network Con
9.56.123.78	WONGSU	00:00:04.000	00:00:04.000	00:00:04.000

Application Name	Connections in Backlog	Percent Out of Order Segments	Percent Segments Retransmitted	Total Datagrams Sent	Datagrams Sent or Received	Datagrams Discarded
D71EDIST	0	0	0	0	0	0
D81LDIST	0	0	0	0	0	0
D91ADIST	0	0	0	0	0	0

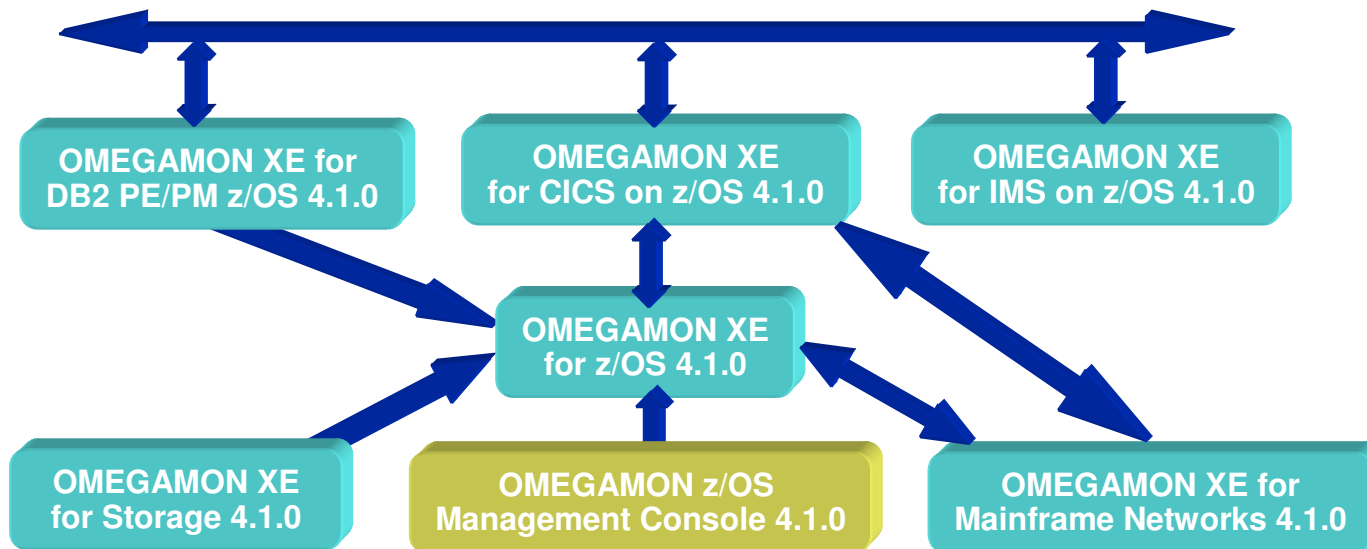


Dynamic Workspace Linking Enables Tight Integration Of Network Monitoring Information

Problem: How do I drill down for additional detail to determine where the problem is?

Scenario: Dynamically link between OMEGAMON DB2 and Network monitoring

Solution: Dynamic Workspace Linking
Product provided links & user customized



Dynamic Workspace Link Drill Down In Context To DB2 Network Information

The screenshot displays the Tivoli Enterprise Portal interface. On the left, a tree view shows the system hierarchy, with 'System Status' selected. A red box highlights 'OMEGAMON DB2 System Status' in the tree. Below the tree, a table shows connection status for 'Dist Net Info - MFN' with columns for 'Waiting On Tape Mount', 'DDF Inactive', and 'Global Trace Active'. A red arrow points from this table to a detailed view of network connections.

The detailed view shows several charts and a table. A red box highlights 'OMEGAMON Mainframe Networks Connection detail' in the top right. The table below shows connection details for two connections:

Application Name	Collection Time	Local IP Address	Local Port	Remote IP Address	Remote Port
DSNBDIST	04/09/07 08:17:36	9.39.64.151	446	9.73.221.109	33057
DSNBDIST	04/09/07 08:17:36	9.39.64.151	446	9.73.221.109	33110

How The DB2 Network Drill Down Link Is Defined

In this example it is necessary to pass the APPLNAME of the DB2 DDF task for drill down (example DSNCDIST).

Click 'Symbol' to specify what information to pass

Use a string function (STR) to add the DB2 subsystem name onto the string DIST

Click 'Evaluate' to see what gets generated by the link.

The screenshot shows the 'Workspace Link Wizard - Parameters' dialog box. The 'Parameter' list includes 'APPLNAME' with the expression `STR($kfw.TableRow:ATTRIBUTE.DP_SY_EXC.ORIGINNODE$, 1, 4)+"DIST"`. The 'Expression Editor - APPLNAME' dialog shows the same expression. The 'Value' dialog shows the result 'DSNCDIST'. The 'DB2 System: DSNCDIST, MVS System: MVSA' is displayed at the bottom.

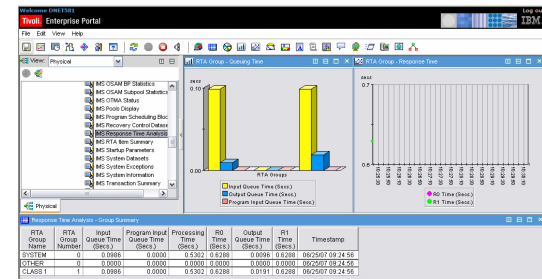
OMEGAMON XE For IMS on z/OS Components And Facilities

Real Time

- **Real Time Monitor**
 - ▶ Subsystems, regions, resources, pools, DBs, Fast path
 - ▶ IMS Connect, OTMA
- **Response Time Analysis (RTA)**
 - ▶ Transaction Response time by user defined groups
- **Bottleneck Analysis**
 - ▶ Workload performance and task analysis
- **Operator Assist & Integrated Console Facility**
 - ▶ IMS resource commands
- **Online Transaction Reporting Facility (Online TRF)**
 - ▶ View transaction information in the TEP
- **Trace Facilities**
 - ▶ Application Trace and Near Term History
- **Multiple System and Plex level information**
 - ▶ N-way data sharing, Global Locking, MSC, shared queues
- **Exceptions & Alerts**
 - ▶ Integrated alert/automation

Historical

- **EPILOG Historical**
 - ▶ Historical analysis of transaction response, bottlenecks and IMS resources
 - ▶ Stored in VSAM Epilog Data Store (EDS) by group and time interval
- **Transaction Reporting Facility (TRF)**
 - ▶ Detailed transaction & database data – individual transactions
 - ▶ Suitable for performance analysis & chargeback
 - ▶ Data retrieved from IMS log
- **XE Snapshot Historical**
 - ▶ Snapshot historical stored in the Tivoli Data Warehouse



Relevant Network Related Information Provided By OMEGAMON XE For IMS

- Network status information and command functions
- Advanced program-to-program communication (APPC) performance information
- OTMA performance information
- Multiple Systems Coupling (MSC) link status and queue information
- Transaction queuing statistics
- IMS Node and IMS Lterm status and queue information
- IMS Connect monitoring
 - ▶ IMS Connect status
 - ▶ Detailed IMS Connect performance and response time information
 - *Requires IMS Connect Extensions in addition to OMEGAMON XE For IMS*



OMEGAMON XE For IMS

Detailed IMS Connect Transaction Level Monitoring

Response Time Detail for Transaction PART Page: 1 of 144

Tran Code	Target Dastore	Client ID	Port Number	User ID	Collection Level	Message Received Time	Response Time	Input Pre-OTMA Time	Input Read Socket Time	Input Read Exit Time	Input Read Exit Name	Input SAF Time	Process OTMA Time	Output Confirm Time	Output Post-OTMA Time	XMIT Exit Time	X
PART	91Y	ICTDRVR	4713	JMAHE	Maximum	01/14/09 12:08:06	0.000139	0.065653	0.000021	0.026154	HWSIMSOO	0.000000	0.118476	0.000000	0.000629	0.000025	HW
PART	91Y	ICTDRVR	4713	JMAHE	Maximum	01/14/09 12:08:06	0.000062	0.000110	0.000018	0.000039	HWSIMSOO	0.000000	0.007838	0.000000	0.000342	0.000015	HW
PART	91Y	ICTDRVR	4713	JMAHE	Maximum	01/14/09 12:08:06	0.000098	0.000089	0.000028	0.000013	HWSIMSOO	0.000000	0.009208	0.000000	0.000587	0.000020	HW
PART	91Y	ICTDRVR	4713	JMAHE	Maximum	01/14/09 12:08:06	0.000113	0.000124	0.000018	0.000016	HWSIMSOO	0.000000	0.023006	0.000000	0.000614	0.000026	HW
PART	91Y	ICTDRVR	4713	JMAHE	Maximum	01/14/09 12:08:06	0.000244	0.000117	0.000019	0.000016	HWSIMSOO	0.000000	0.007549	0.000000	0.000588	0.000020	HW
PART	91Y	ICTDRVR	4713	JMAHE	Maximum	01/14/09 12:08:06	0.000096	0.000123	0.000030	0.000016	HWSIMSOO	0.000000	0.010288	0.000000	0.000622	0.000020	HW
PART	91Y	ICTDRVR	4713	JMAHE	Maximum	01/14/09 12:08:06	0.000093	0.000124	0.000020	0.000018	HWSIMSOO	0.000000	0.008585	0.000000	0.000601	0.000020	HW
PART	91Y	ICTDRVR	4713	JMAHE	Maximum	01/14/09 12:08:06	0.000080	0.000108	0.000016	0.000016	HWSIMSOO	0.000000	0.010068	0.000000	0.000550	0.000017	HW
PART	91Y	ICTDRVR	4713	JMAHE	Maximum	01/14/09 12:08:06	0.000078	0.000115	0.000018	0.000014	HWSIMSOO	0.000000	0.008033	0.000000	0.000620	0.000018	HW
PART	91Y	ICTDRVR	4713	JMAHE	Maximum	01/14/09 12:08:06	0.000082	0.000105	0.000018	0.000014	HWSIMSOO	0.000000	0.008343	0.000000	0.000542	0.000017	HW
PART	91Y	ICTDRVR	4713	JMAHE	Maximum	01/14/09 12:08:06	0.000125	0.000124	0.000019	0.000018	HWSIMSOO	0.000000	0.009186	0.000000	0.000647	0.000029	HW

Response Time Detail for Transaction PART Page: 1 of 144

Tran Code	Target Dastore	Client ID	Port Number	User ID	Collection Level	Message Received Time	MIT Exit Name	Time Outs	Commit Mode	Synchronization Level	NAK Count	OTMA NAK Sense Code	Client IP Address	Client IP Port	Timestamp	Sysplex Name
PART	91Y	CTDRVR	4713	JMAHE	Maximum	01/14/09 12:08:06	/SIMSOO	0	CM1	None	0	N/A	9.42.46.28	2999	01/14/09 12:13:04	LPAR400J
PART	91Y	CTDRVR	4713	JMAHE	Maximum	01/14/09 12:08:06	/SIMSOO	0	CM1	None	0	N/A	9.42.46.28	3000	01/14/09 12:13:04	LPAR400J
PART	91Y	CTDRVR	4713	JMAHE	Maximum	01/14/09 12:08:06	/SIMSOO	0	CM1	None	0	N/A	9.42.46.28	3001	01/14/09 12:13:04	LPAR400J
PART	91Y	CTDRVR	4713	JMAHE	Maximum	01/14/09 12:08:06	/SIMSOO	0	CM1	None	0	N/A	9.42.46.28	3002	01/14/09 12:13:04	LPAR400J
PART	91Y	CTDRVR	4713	JMAHE	Maximum	01/14/09 12:08:06	/SIMSOO	0	CM1	None	0	N/A	9.42.46.28	3003	01/14/09 12:13:04	LPAR400J
PART	91Y	CTDRVR	4713	JMAHE	Maximum	01/14/09 12:08:06	/SIMSOO	0	CM1	None	0	N/A	9.42.46.28	3004	01/14/09 12:13:04	LPAR400J
PART	91Y	CTDRVR	4713	JMAHE	Maximum	01/14/09 12:08:06	/SIMSOO	0	CM1	None	0	N/A	9.42.46.28	3005	01/14/09 12:13:04	LPAR400J
PART	91Y	CTDRVR	4713	JMAHE	Maximum	01/14/09 12:08:06	/SIMSOO	0	CM1	None	0	N/A	9.42.46.28	3006	01/14/09 12:13:04	LPAR400J
PART	91Y	CTDRVR	4713	JMAHE	Maximum	01/14/09 12:08:06	/SIMSOO	0	CM1	None	0	N/A	9.42.46.28	3007	01/14/09 12:13:04	LPAR400J
PART	91Y	CTDRVR	4713	JMAHE	Maximum	01/14/09 12:08:06	/SIMSOO	0	CM1	None	0	N/A	9.42.46.28	3008	01/14/09 12:13:04	LPAR400J
PART	91Y	CTDRVR	4713	JMAHE	Maximum	01/14/09 12:08:06	/SIMSOO	0	CM1	None	0	N/A	9.42.46.28	3009	01/14/09 12:13:04	LPAR400J
PART	91Y	CTDRVR	4713	JMAHE	Maximum	01/14/09 12:08:06	/SIMSOO	0	CM1	None	0	N/A	9.42.46.28	3010	01/14/09 12:13:04	LPAR400J

OMEGAMON XE For IMS V4.x provides support for IMS Connect monitoring. Provides detailed transaction level response time information.

Note – Detailed IMS Connect monitoring requires IMS Connect Extensions.



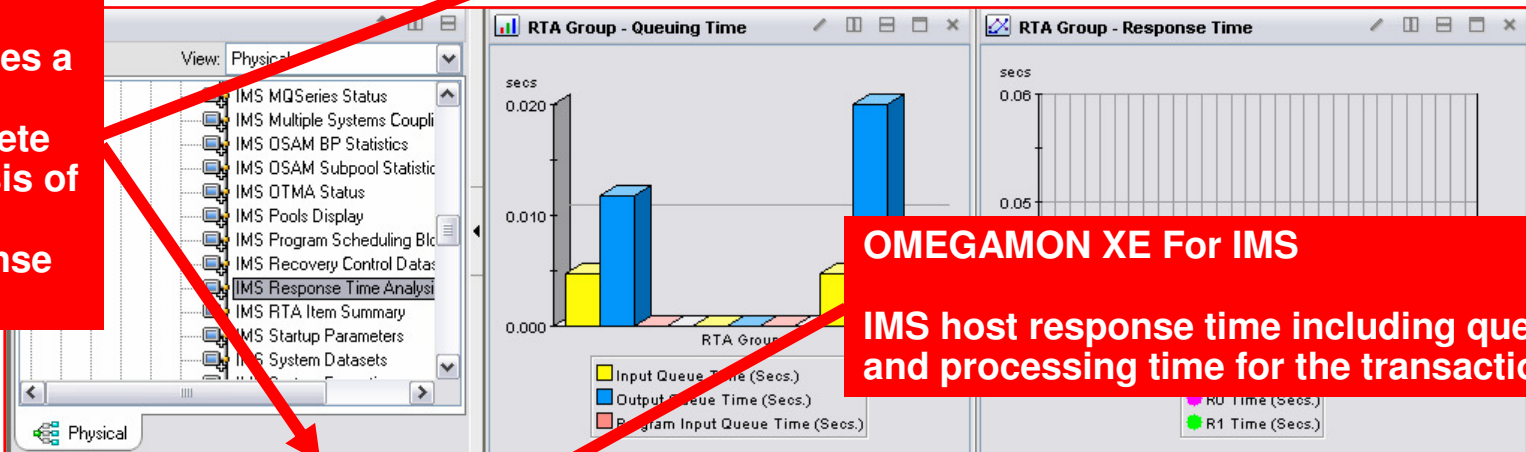
Understanding IMS Response Time

OMEGAMON XE For Mainframe Networks

Network time for IMS transactions

Total Bytes Received	Total Bytes Sent (in GB)	Total Bytes Sent	Total Bytes (in GB)	Total Bytes	Bytes Received	Bytes Sent	Bytes Sent or Received	Time Since Last Activity	Byte Rate	Response Time	Response Time Variance	Telnet Appl Name	Telnet LU Name	Seg Retra
670	0	6906	0	7576	291	2402	2693	14.00	53	0.98	0.02	IMSACB	TCP00012	
		298402	0	306704	105	5123	5228	80.66	104	1.13	0.11	DDCTSO03	TCP00010	
		11737	0	815097	0	0	0	243,022.19		0.01	0.01			
		0	0	3	0	0	0	651,449.87		0.82	11.24			
		0	0	3	0	0	0	759,051.09		1.03	11.24			

Including network monitoring detail provides a more complete analysis of IMS response time



OMEGAMON XE For IMS

IMS host response time including queue and processing time for the transaction

RTA Group Name	RTA Group Number	Input Queue Time (Secs.)	Program Input Queue Time (Secs.)	Processing Time (Secs.)	R0 Time (Secs.)	Output Queue Time (Secs.)	R1 Time (Secs.)	Timestamp
SYSTEM	0	0.0047	0.0000	0.0410	0.0458	0.0117	0.0458	01/17/09 11:43:46
OTHER	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	01/17/09 11:43:46
CLASS 1	1	0.0047	0.0000	0.0410	0.0458	0.0200	0.0458	01/17/09 11:43:46

Leverage The Power Of The Portal Create An Integrated View Of IMS Response Time

Tivoli Enterprise Portal Welcome DNET581 Log out IBM

File Edit View Help

Navigator

View: Physical

- IMS Response Time Analysis
- IMS RTA Item Summary
- IMS Startup Parameters
- IMS System Datasets
- IMS System Exceptions
- IMS System Information

RTA Group - Queuing Time

RTA Group - Response Time

Create a custom workspace to pull together host and network response time

Response Time Analysis - Group Summary

RTA Group Name	RTA Group Number	Input Queue Time (Secs.)	Program Input Queue Time (Secs.)	Processing Time (Secs.)	R0 Time (Secs.)	Output Queue Time (Secs.)	R1 Time (Secs.)
SYSTEM	0	0.0049	0.0000	0.0228	0.0277	0.0040	0.0277
CLASS 1	1	0.0049	0.0000	0.0228	0.0277	0.0063	0.0277

Network Response Time

Application Name	Foreign IP Address	Response Time	Response Time Variance	Telnet Appl Name	Telnet LU Name	Cor Nu
TN3270	9.76.7.96	0.96	0.02	IMSACB	TCP00012	0X0

IMS RTA host performance (OMEGAMON XE For IMS)

IMS Network response time (OMEGAMON XE For Mainframe Networks)



Use the TEP to create an integrated end to end performance management view that includes a graphic overview showing DB2, IMS, CICS, and network

The screenshot displays the OMEGAMON XE performance management interface. The main window, titled "Graphic View", shows an "End To End Management View" diagram. This diagram illustrates the flow of data and performance metrics between various system components: App Servers (UNIX and Windows), Network, CICS, DB2, z/OS, and Storage. A central "Network" icon is connected to "App Server" and "DB2". "CICS" and "z/OS" are connected to "DB2". "Storage" is connected to "z/OS".

On the left, a "View: Integrated Overview" pane lists various performance categories such as CICS Performance, DB2 Performance, and z/OS Performance. On the right, a "Critical Applications Net..." table shows connection counts and byte rates for applications like CICSL153, DB1LDIST, and IMS9FCON. Below this is a line graph showing "Transmit Byte Rate", "Receive Byte Rate", and "Byte Rate" over time.

At the bottom, three data tables are visible: "CICS Response Time", "IMS Response Time", and "DB2 Distributed Performance".

Create situation alerts

Network Performance (OMEGAMON XE For Mainframe Networks)

Integrated graphic overview

CICS performance (OMEGAMON XE For CICS)

IMS performance (OMEGAMON XE For IMS)

DB2 performance (OMEGAMON XE For DB2 PM/PE)

Situations provide powerful event management and problem isolation

Icons highlight issues

Situations identify issues with drill down analysis capabilities

Product provided situations offer monitoring and management best practices

Application Name	Connection Count	Transmit Byte Rate	Receive Byte Rate
CICSL153	3	221	2
DB1LDIST	2	0	
IMS9FCON	3	0	

CICS Region Name	Transaction	Start Time	End Time	Response Time
CICSL153	TRAN GRP D*	00:00:00		
CICSL153	TRAN GRP E*	00:00:00		

Originnode	SQL Calls Sent	SQL Calls Received	Data Rows Sent
D81L:SYSL:DB2	4	4	105

Isolate The Problem

The Situation Detail Drill Down Display

What is the problem?

What are the details?

Datagram Rate	Origin Node	System ID	Host Name	TCPIP STC Name	Collection Time	Application Name	Connection Count	Total Bytes Received
4854	TCPIP:MVSA	MVSA	DEMOMVS	TCPIP	08/02/07 13:07:46	OSNMPD	2	996851785

Any Predefined Actions?

Any expert advice?

Expert Advice
N3T_Appl_Datagram_Rate
 Situation Description: Application datagram rate per minute.
 Suggested Actions: The sum of the datagram rate for all

Hub Time: Thu, 08/02/2007 01:13 PM | Server Available | N3T_Appl_Datagram_Rate - hqdt2.d

Product Provided Situations Provide A Starting Point For Alert Management

The screenshot shows the 'Situation Editor' window with a list of situations on the left and a configuration panel on the right. The list includes various network-related metrics such as 'N3T_Appl_Backlog_Conns_Rejected', 'N3T_Conn_Byte_Rate', and 'N3T_CPU_Pct_Critical'. The configuration panel includes sections for 'Click', 'Situation name', 'Set Situation filter', 'Formula', 'Distribution', 'Expert Advice', and 'Action'.

Each OMEGAMON monitoring solution provides a set of product provided situations.

OMEGAMON XE For Mainframe Networks product provided situations.

Use product provided situations as examples or templates.

- VTAM
 - N3V_BuffPool_Buf_Avail
 - N3V_BuffPool_Buf_Expan_Lim_Pct
 - N3V_BuffPool_Queue_Req
 - N3V_CPU_Pct_Critical
 - N3V_CPU_Pct_Warning
 - N3V_CSA_Pct_Below_16MB
 - N3V_HPR_Pct_Packets_Rexmit
 - N3V_HPR_Conn_OOS_Buffers
 - N3V_HPR_Conn_Path_Switch
 - N3V_HPR_Throughput
 - N3V_Paging_Rate
 - N3V_Pct_ECDSA_Allocated_Stg
 - N3V_Total_CSA_Pct

Use OMEGAMON XE For Mainframe Networks To Alert On DB2 Distributed Network Issues

Boolean logic capability of the situation editor allows for detailed and targeted alerts

DB2 DDF task

	Application Name	Percent Segments Retransmitted	Response Time Variance	Datagram Rate
1	== D91LDIST		>= 2.00	
2	== D91LDIST	>= 1		
3	== D91LDIST			> 1000

And/or Alert criteria

Alert when the DB2 DDF task is having issues such as segment retransmission, high response variance, or high transmission rate

Response Time Variance: The number of times the response time for a connection has exceeded the specified value since the connection was established. The response time is the time taken to receive the first byte of data from the connection.

Segments Retransmitted: The number of segments retransmitted over this connection during the most recent time interval.

Sampling interval: 0 / 0 : 15 : 0 (ddd hh mm ss)

Run at startup

Use OMEGAMON XE For Mainframe Networks To Alert On IMS Transaction Network Issues

And/or Alert criteria

Formula

	Response Time	Response Time Variance	Telnet Appl Name
1	>= 2.00		abc == IMS
2		> 2.00	abc == IMS
3			

IMS Appl name

Alert when IMS transactions have high network response time or high response time variance

Description

Response Time The elapsed time (in tenths of a second) from when the segment was sent to when the acknowledgment was received. The format is a real number.

Response Time Variance The statistical variation of round trip times since the connection was established. The format is a real number.

22% Add conditions... Advanced...

Sampling interval: 0 / 0 : 2 : 0 (ddd hh mm ss)

Sound: Enable critical.wav Play Edit...

State: **Critical** Run at startup:

OMEGAMON XE For Mainframe Networks And NetView Integration In The TEP

NetView Workspaces

- CXEGNA:MVSA:KNAAGENT
 - NetView/NetCool Web
 - CNM16
 - DVIPA Connections
 - DVIPA Definition and Status
 - DVIPA Distributor Targets
 - DVIPA Sysplex Distributors
 - NetView Audit Log
 - NetView Command Response
 - NetView Health
 - NetView Log
 - Session Data
 - Stack Configuration and Status
 - TCPIP Connection Data

Mainframe Networks Workspaces

- Mainframe Networks
 - VCN3H@L:SYSL:KN3AGENT
 - TCPIP
 - TCPIPL:SYSL
 - Address Space
 - Applications
 - Connections
 - Gateways and Devices
 - FTP
 - Interfaces
 - OSA
 - TCPIP Memory Statistics
 - TCPIP Stack Layers
 - TN3270

TCPIP Connection Data Summary

Resource Name	Connection ID	Total Bytes Received	Total Bytes Sent	Total Bytes	Bytes Received	Bytes Sent	Bytes Sent or Received	Byte Rate	Total Segments Retransmitted	Segments Retransmitted	Percent Segments Retransmitted	Tot Segm Rece
DSNBDIST	0X00046F56	105506500	34007793	139514293	380662	123044	503706	33580	2	0	0	15
DSNCDIST	0X000918D0	98894	27443	126337	98894	27443	126337	11485	0	0	0	
DSNCDIST	0X0008C1DC	9378865	3279963	12658828	360239	126968	487207	32480	0	0	0	1
IBMSM2	0X0009013F	24357	192029	216386	480	15279	15759	1050	0	0	0	

- NetView provides an agent capability to plug in to the TEP
 - ▶ Allows the addition of VIPA and TCPIP connection information into workspaces
- Dynamic workspace links
 - ▶ Integration between OMEGAMON XE For Mainframe Networks, NetView, and other OMEGAMONS

Tivoli Enterprise Portal History Collection For Network Performance Data

History Collection Configuration

Select a product
OMEGAMON XE for Mainframe Networks V4.1.0

Select Attribute Groups

Group	Collection	Collection Interval	Collection Location	Warehouse Interval	Summarize Yearly	Prune Yearly	S.U.
TCPIP_FTP							
HPR_RTP_Connections							
VTAM_Summary_Statistics							
TCPIP_Applications		15 minutes	TEMS	1 hour			
TCPIP_Address_Space							
TCPIP_Devices		15 minutes	TEMA	Off			

Configuration Controls

Collection Interval: 15 minutes

Collection Location: TEMS

Warehouse Interval: 1 hour

Summarization

Yearly
 Quarterly
 Monthly
 Weekly
 Daily
 Hourly

Pruning

Yearly keep [] Years
 Quarterly keep [1] Years
 Monthly keep [] Months
 Weekly keep [] Months
 Daily keep [] Days

Configure Groups | Stop Collection

Plot Chart

Hub Time: Tue, 04/10/2007 09:05 AM | Server Available | System Status - hqndt2.demopkg.ibm.com

Select desired group of information, collection interval, and destination

Collect at the TEMA or the TEMS

To warehouse or not to warehouse
Hourly, Daily, or not at all

Specify summarization and pruning along with collection interval

Graphics make it easier to spot peaks and valleys over time

35

Strategy Summary

- OMEGAMON XE For Mainframe Networks will plug into the existing Tivoli Enterprise Portal (TEP) infrastructure
 - ▶ Provides detailed network application level and connection level monitoring information
- OMEGAMON XE For Mainframe Networks benefits
 - ▶ Data may be included in integrated monitoring workspaces
 - ▶ Dynamic workspace links may be used to enable drill down for detailed analysis of network performance metrics
 - ▶ Situation alerts may be crafted to alert based upon network issues
- Optionally – If NetView is available consider enabling the NetView agent into the TEP
 - ▶ Will provide connection, VIPA, and other network relevant information



Thank You!

