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Managing Your Sysplex with NetView for z/OS 5.4

Pam McLean (pamm@us.ibm.com) October 2, 2009



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Agenda

- Enabling NetView to Manage a Sysplex
- XCF Services Details
- Discovery Manager
- DVIPA Discovery, Events, and DDVIPA Statistics



NetView as a Sysplex Application



Enabling NetView to Manage a Sysplex

- Provides management from a single point of control for a "true" sysplex in NetView 5.4 (Master NetView)
- To achieve this:
 - Make NetView a sysplex application
 - Determine which items to discover
 - Determine which user interfaces (UIs) to use
- Requires z/OS 1.9 or later
 - Some functions only available with z/OS V1R11 Communications Server



NetView as a Sysplex Application

- Use XCF Services for communication between NetViews
- Allow RMTCMD to use DVIPA for the NetView application
- Use RODM as the data cache
 - GRAPHICS tower is no longer needed



Discovery

- Sysplex, coupling facility, z/OS image, NetView application, and TCP/IP stack and TCP/IP subplex discovery is enabled by default
 - Interface, Telnet server and port discovery (must be enabled)
 - OSA and HiperSockets discovery requires RODM (must be enabled)



- DVIPA functions are disabled by default
 - Includes DVIPA, distributed DVIPA (DDVIPA), DVIPA connections, VIPA routes, and DDVIPA connection routing
 - Determine whether to use DVIPA events for up to date information
 - Determine whether to use DDVIPA workload statistics for problem determination or historical information



Discovery per z/OS Image

- Each z/OS image requires a NetView with discovery enabled for the desired functions to provide a complete view of the sysplex
 - A network NetView is not required
- Support for multiple NetViews on a single z/OS image is also provided
 - Option to discover just enough information to instantiate additional NetView
 - Prevents extra CPU utilization discovering identical resources



User Interfaces

- NetView 3270 console
 - Commands are available for discovered information (sysplex, DVIPA, OSA, and HiperSockets)
 - Provides real-time data
 - Has a REXX command interface and a sample command (user-friendly) interface
 - Output is in the form of an MLWTO and can be automated
- NetView Management Console (NMC)
 - Topology is available for sysplex, OSA, and HiperSockets information
 - Commands are provided for some sysplex resources
 - Provides data based on sampling, events, or both



User Interfaces cont.

- Tivoli Enterprise Portal (TEP) using the NetView for z/OS Enterprise Management Agent
 - Workspaces are provided for discovered information (sysplex, DVIPA, OSA, and HiperSockets)
 - New Take Action commands are provided
 - New situations and expert advice are provided
 - Provides data based on sampling, events, or both
- NetView Web application
 - Continues to display sysplex and DVIPA data as was provided in NetView 5.3

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High Level Architectural Components



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"Mini Enterprise" – Enterprise Level RODM





XCF Services Details



XCF Services Overview

- XCF support is enabled by default, but it can be disabled
- NetView will use XCF services to establish a sysplex-wide group called DSIPLXnn
 - Each NetView in the sysplex can be a member of the group (one member per NetView domain)
 - XCF drives exits to inform all group members of events affecting one of the members, such as:
 - Entering or leaving the group
 - Updating shared information with the group
 - XCF provides send and receive services between members for communications purposes



How Does NetView Use XCF?

XCF exits

- Allow NetViews to know when the master has failed or become disabled so a master-capable NetView can take over
- Allow NetView to know when new NetView has become active so resource status forwarding can be sent up to the master
- XCF messaging
 - Support internal communication between NetViews so control information can flow between group members



XCF Services Configuration

XCF Parameter	NMPIPL12	NMPIPL30	NMP190
RANK	250	100	1
GROUPNUM	01	01	01
PROCSTR01	*NONE*	RODM,TYPE=C,INIT=EKGLISL M	*NONE*
PROCSTR02		GMFHS.C	
PROCSTR03		CANSNA	
INTWAIT	10	10	0
TAKEOVER.DURATION	5	5	0
TAKEOVER.CLIST	*NONE*	*NONE*	MONTHEND
TAKEOVER.DELAY	0	600	0
TAKEOVER.NETCONVS	YES	YES	NO
TAKEOVER.CONVIP1	1.2.3.4/4022	1.2.3.4/4022	



Master Initialization and Data Flow

NVDPLEX1



4. Master NetView NTV7A initiates RMTCMD to NetView NTVE6



Displays showing NetView status



CNMSNVST DOMAIN=ALL output

CNM	KWIND OUT	PUT FROM	DOMAIN=ALL			LINE 0 OF 6	workspace is als
ж				op of Data			
BNH	495I NUMB	ER OF NET	VIEW APPLICAT	[IONS: 4			2
#	Domain	Status	Total-CPU %	Total-Stor	Role	Sysplex-Role	Syspl
1	NTV7A	ACTIVE	10.22	95116	NETWORK	MASTER	250
2	NTV74	ACTIVE	7.73	68792	NETWORK	MCAP	1
3	NTV70	ACTIVE	8.00	54052	NETWORK	MCAP	1
4	NTVE6	ACTIVE	8.77	80760	NETWORK	MCAP	100
ж			Во	ottom of Da	ta		ж

NetView

Application



OSA Port Topology – Parent View





Master NetView Failover

NVDPLEX1





XCF Services Commands

- LIST STATUS=XCFGRPS
 - Returns a list of z/OS XCF groups in which the NetView participates
- PLEXCTL
 - Changes the rank of the NetView in the DSIPLXnn in which it participates
- START/STOP XCFGROUP
 - Specifies the name of the XCF group to join or leave
- PIPE stages XCFMSG, XCFTABLE, and XCFQUERY
- Commands, keywords, and pipe stages are restricted to highest authority operators





Discovery Manager



Discovery Manager

- Previously called Sysplex IP Stack Manager
- Functionality expanded to discover additional sysplex and System z resources providing more robust IP management
- Data collected using a combination of events (message automation) and sampling
- Provided manual rediscovery capability
- Information forwarded to a master and enterprise NetView
- Compatibility PTF provided for NetView 5.2 and 5.3 so Sysplex IP Stack Manager information is still available in NetView 5.4 for migration



Discovery Manager Components





Scenario: Subplex - Socket Connection Failed

- NetView socket application program is written to communicate to all stacks in the sysplex
- Connection fails from NMPIPL12 stack TCPIP to NMPIPL10 stack TCPIPB
- Using NMC, system programmer determines that the stacks are in a different subplex and therefore cannot communicate
- Note that the subplex name for the TCP/IP stack is also provided in the Stack Configuration and Status 3270 command output and TEP workspace

Scenario: Subplex – Configuration Logical





Scenario: Subplex – More Detailed Logical





Scenario: Diagnosing HiperSockets Interface Problem

- An operator reports that NMC topology is showing interfaces named IQDIO as being inactive after a system outage due to maintenance. The interfaces are connected to the HiperSockets node
- System programmer asks the operator to see if there are other interfaces that are connected to the HiperSockets node
- The operator reports that there are interfaces named IQDIOLNK
- System programmer concludes that the static HiperSockets interfaces are not active and activates them



Scenario: HiperSockets Interfaces





Scenario: Diagnosing Telnet Server Outage

- A user reports that they can no longer establish Telnet connections to Telnet server TN3270B
- The operator looks at the Telnet Server Configuration and Status workspace and notices that TN3270B is inactive
- The operator restarts the server and monitors that connections are once again being established

Scenario: Telnet Server Inactive



Scenario: Telnet server now active





DVIPA Discovery, Events, and DDVIPA Statistics



DVIPA Discovery

- Enhanced commands and workspaces to provide better problem determination
- Provided additional functionality:
 - DVIPAs by type (Application instance, stack-defined, DDVIPA)
 - DVIPA summary information by TCP/IP stack
 - VIPA Routes
 - Distributed DVIPA connection routing
- Improved performance
- Data collected using a combination of events and sampling
- Provided manual rediscovery capability
- Information forwarded to a master NetView



DVIPA Events

- DVIPA Events can be used to provide a better "real time" view of DVIPA information. NetView is providing automation for three types of DVIPA Events:
 - DVIPA SNMP Traps
 - Uses NetView SNMP trap DST
 - DVIPA Configuration Changes
 - Requires z/OS V1R11 Communications Server
 - Sysplex Autonomics messages
- When a DVIPA event is received:
 - NetView will bundle the events using configurable delays
 - Notify the master that this system needs rediscovering
 - The master NetView also has a delay to bundle the event messages
 - Send rediscovery commands to all systems in the sysplex impacted by the event



Scenario: DVIPA Events Before OBEYFILE



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6:55

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Scenario: DVIPA Events After OBEYFILE





Distributed DVIPA Statistics

- Provides the capability to collect workload distribution for each distributed DVIPA target
 - Used for problem determination
 - Used for historical data
- Collects data after each DDVIPA discovery is done
- Starts during NetView initialization or using DVIPALOG command
- Writes data to a sequential data set
 - Primary and secondary data sets allocated
 - Messages indicate data set switching
- Sample CNMSDVST shows data in both data set on NetView 3270 console
- Forwards data to master NetView, if configured to do so
- Reports (not provided by NetView) can be written against the data
 - Historical DDVIPA data can still be gathered using ITM



DDVIPA Statistics Information Provided

- STCK
- Date
- Time
- System
- TCP Job Name
- DDVIPA
- DDVIPA Port
- Target System

- Target TCP Job Name
- Distribution Method
- Total Connections
- Delta Connections
- WLM Weight
- SD Percentage TCP Connections
- Percentage WLM Weight



Scenario: Diagnosing DDVIPA Workload

- You think you have a sysplex distributor workload balancing problem for FTP port 21
- To do a complete analysis, you'll want to verify:
 - DVIPA Configuration
 - Distributors
 - Targets
 - Distribution metrics which includes the health of the server
 - DDVIPA statistics output



Scenario: Stack Configuration and Status

1. From TEP Navigator, Select Stack Configuration and Status Summary workspace.



Scenario: DVIPA Stack Summary

 Verify that the specified Sysplex Distributor is Active.

Note that the local system
 (NMPIPL12) has
 1 connection.

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201.3.10.60	23	1931112	1	0	0	0X80										
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Scenario: DDVIPA Targets

Connections were only distributed to two systems

📑 Di	stributed DVIPA	Fargets - PAMMYK	INS4 - SY	SADMIN											-	
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	04/10/09 16:04:52	201.3.10.60	1700	UNKNOWN	NMPIPL30	NMPIPL3							0X80	EZBTCPCS	TCPIP	0X0
	04/10/09 16:04:52	201.3.10.60	1700	T540EENV	NMPIPL12	NMPIPL12							OX80	EZBTCPCS	TCPIP	0X0
	04/10/09 16:04:52	201.3.10.59	1700	UNKNOWN	NMPIPL30	NMPIPL30	193.1.1.30	0	0		0 0	No	0X80	EZBTCPCS	TCPIP	0X0
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Scenario: DDVIPA Server Health

WLM weights indicate connections should be distributed almost evenly across 3 of the 4 systems

ы (istributed DVIPA S	Gerver Health	- PAMMYKINS4 -	SYSADMIN	N											
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0	04/10/09 16:04:52	FTPD1	201.2.10.212	21	193.1.1.30	NMPIPL30	100	5	0	100	100	100	3	21	21	0
	04/10/09 16:04:52	FTPD1	201.2.10.212	21	193.1.1.12	NMPIPL12	100	4	0	100	100	100	100	19	19	0
	04/10/09 16:04:52	TN3270	201.2.10.202	23	193.1.1.10	NMPIPL10	100	5	0	100	100	100	18	22	22	0
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Scenario: DDVIPA Statistics

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578 04/10/09 16:04:52 NMPIPL12 TCPIP 201.3.).60 1700 NMP190 T(CPIP BaseWLM 0	0 0 0
579 04/10/09 16:04:52 NMPIPL12 TCPIP 201.3.	0.60 1700 NMPIPL30 TO	CPIP BaseWLM 0	5 0 36
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୍ତ୍ରୀ Connected to remote server/host ralvmr.raleigh.ibm.com using port 23	Canon MP830 Series Printer on USB001	aleigh.ibm.com using port 23	Canon MP830 Series Printer on USB001



For More Information



For More Information

NetView Home Page

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

- Downloads (NMC, MSM agents, tools)
- Release comparison
- Link to Announcement letter
- Links to other online information sources
- More
- NetView Documentation

http://publib.boulder.ibm.com/infocenter/tivihelp/v3r1/index.jsp?toc=/com.ibm.itnetviewf orzos.doc/toc.xml

NetView Customer Forum

http://groups.yahoo.com/group/NetView/

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Tivoli Software Training Page

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Events Success stories Training	Asia Pacific: tivtrainingap@au1.ibm.com EMEA: tived@uk.ibm.com * Classroom * Differences * Document		
· Certification Services	* Foundation * How-to * Self-paced * Web Skills Classroom		Web site contains links
Community How to buy Support	Title AF/OPERATOR and OMEGACENTER Gateway Basics CIMS Server 4.3 Implementation and Administration	Duration 5 Days 3 Days	roadmaps, including
Related links Warranty info	 → Comprehensive Technical Training for IBM Tivoli → Configuring WebSphere MQ using IBM Tivoli OMEGAMON XE for WebSphere MQ 	15 Days As needed	prerequisite and
Business Partners Tivoli Developer Domain Resource Center Lodustry Solutions	 Creating an ETL for Tivoli Data Warehouse 1.2 Deploying an Integrated IBM Tivoli Security Solution Disaster Preparation and Recovery for IBM Tivoli Storage Manager 5.3 Example The Theorem 4.5 	4 Days 3 Days 2 Days	supplemental training.
 Licensing Contact Tivoli IBM Tivoli Open Process Automation 	 Extending IBM Tivoli Identity Manager 4.6 IBM OMEGAMON z/OS Management Console 1.1.0 IBM Tivoli Access Manager for Business Integration 5.1 System Administration IBM Tivoli Access Manager for e-business 6.0 Customization 	4 Days As needed 3 Days 4 Days	

http://www.ibm.com/software/tivoli/education/edu_type.html

Classes

New / updated classes

- NetView for z/OS 5.3 Technical Update
 - October 20-1, Berlin
 - http://www.ibm.com/services/learning/de/ta-iris.nsf/(ExtCourseNr)/TM78D0DE
- NetView for z/OS 5.3 Workshop: Fundamentals, Automation, REXX and PIPEs
 - September 28 October 2, Paris,
 - October 5-9, London
 - October 13-17, Pittsburgh
 - November 2-6, San Francisco
 - May 17-21, Berlin
 - http://www.ibm.com/software/tivoli/education/U188790N96197Y71.html
- NetView for z/OS 5.3 Workshop: Fundamentals
- NetView for z/OS 5.3 Workshop: Automation Techniques
- NetView for z/OS 5.3 Workshop: REXX Programming
- NetView for z/OS 5.3 Workshop: NetView PIPEs



Where to find Web Seminars

- Recordings of all Web Seminars are available at the STE Web page:
 - http://www.ibm.com/software/sysmgmt/products/support/supp_tech_exch.html
- Search Previous Webcasts
 - NetView for z/OS





Webinars

- Descriptions and Recordings
 - http://www.ibm.com/software/tivoli/education/edu_prd.html#N
- Examples
 - NetView for z/OS 5.3 Enterprise Management Agent (EMA)
 - TCP/IP Management Part 1
 - TCP/IP Management Part 2
 - Automation
 - Time to Value, Ease of Use, and Migration Considerations



IBM System z Advisor

- A monthly e-newsletter to provide IBM System z practitioners with a mechanism to broaden System z knowledge and keep up to date with technical developments and futures.
- Launched August 2009
- Replaces CCR2
- System z Advisor home page
 - http://www-01.ibm.com/software/tivoli/systemz-advisor/



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Backup

And A



System Definition (XCF.RANK)

- XCF.RANK determines position in sysplex
 - Value a number from 0-250
 - 0 cannot be a master
 - 1-249 is master capable. Highest ranked NetView is first to take over as master, if needed.
 - -1 indicates that NetView will not participate in an XCF group
 - NetView domain name used as tie breaker when NetViews have the same rank
 - Default rank is 1



System Definition – Other XCF Statements

- XCF.GROUPNUM = 01
 - Two character suffix defining the DSIPLXxx group which this NetView can join
- XCF.TAKEOVER.DURATION = 5
 - Specifies how long (in minutes) a master will hang onto role before allowing anyone else to become master (used to avoid thrashing)
- XCF.TAKEOVER.CLIST = *NONE*
 - > Specifies a user-written command list to run when NetView takes over as group master.
- XCF.TAKEOVER.INITWAIT = 10
 - Specifies how long (in minutes) a backup will wait when it comes up before taking over as master if there is none in the sysplex. (The wait period gives the master a chance to come up.)



System Definition – Other XCF Statements cont.

XCF.TAKEOVER.DELAY = 0

- Specifies how long to wait (in seconds) before attempting data discovery when NetView takes over as master. Valid values are 0 (the default) to 3600.
- XCF.TAKEOVER.NETCONVS = YES
 - Specifies whether a NetView taking over as master is to attempt to establish NETCONV connections/sessions that were active at a previous master. Values are YES or NO. The default is YES.
- XCF.TAKEOVER.CONVIP1
 - Specifies one or more NMC servers to whom NetView should attempt to establish NETCONV connections when taking over as master.

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Discovery Manager Summary

Data Discovered	Tower (or subtower)	Event or Sampled	Sampling Interval (seconds)	User Interfaces
Sysplex	DISCOVERY	Event		NMC
Coupling Facility	DISCOVERY	Event		NMC
z/OS Image	DISCOVERY	Event		NMC, TEP
NetView Application	DISCOVERY	Event and Sampled	300	3270, NMC, TEP
TCP/IP Stack	DISCOVERY	Event		3270, NMC, TEP
TCP/IP Subplex	DISCOVERY	Event		3270, NMC
TCP/IP Interface	DISCOVERY.INTERFACES	Sampled	3600	3270, NMC
Telnet Server and Port	DISCOVERY.TELNET	Event and Sampled	3600	3270, NMC, TEP

Discovery Manager Summary cont.

Data Discovered	Tower (or subtower)	Event or Sampled	Sampling Interval (seconds)	User Interfaces
OSA	DISCOVERY.INTERFACES.OSA	Sampled	3600	3270, NMC, TEP
HiperSockets	DISCOVERY.INTERFACES.HIPERSO CKETS	Sampled	3600	3270, NMC, TEP



Discovery Manager Commands and Samples

- NVSTAT (CNMSNVST)
 - Displays NetView application configuration and status information
- STACSTAT (CNMSSTAC)
 - Displays TCP/IP stack configuration and status information
- IFSTAT (CNMSIFST)
 - Displays IP interface information
- TELNSTAT (CNMSTNST)
 - Displays Telnet server information
- TNPTSTAT (CNMSTPST)
 - Displays Telnet server port information



Discovery Manager Commands and Samples cont.

- OSAPORT (CNMSOSAP)
 - Displays OSA channel and port information
 - IOBSNMP must be running to collect OSA information
- HIPERSOC (CNMSHIPR)
 - Display HiperSockets status and configuration information

Note: OSA and HiperSockets information requires RODM to be active, but GRAPHICS tower is not required



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DVIPA Discovery Summary

Data Discovered	Tower (or subtower)	Event or Sampled	Sampling Interval (seconds)	User Interfaces
DVIPA Definition and Status	DVIPA	Sampled and Event	3600	3270, TEP
Distributed DVIPA	DVIPA.DVTAD	Sampled and Event	3600	3270, TEP
* DVIPA Connections	DVIPA.DVCONN	Sampled	3600	3270, TEP
VIPA Routes	DVIPA.DVROUT	Sampled and Event	3600	3270, TEP
* DDVIPA Connection Routing	DVIPA.DVROUT	Sampled	3600	3270, TEP

* Data is not forwarded to master NetView due to potential large volumes

IEM

DVIPA Commands and Samples

- DVIPSTAT (CNMSDVIP)
 - Displays DVIPA definition and status information
- DVIPPLEX (CNMSPLEX)
 - Displays Distributed DVIPA (DDVIPA) information
- DVIPTARG (CNMSTARG)
 - Displays Distributed DVIPA targets information
- DVIPHLTH (CNMSDVPH)
 - Displays DDVIPA server health information
- DVIPCONN (CNMSDVPC)
 - Displays DVIPA connections
- VIPAROUT (CNMSVPRT)
 - Displays VIPA route information
- DVIPDDCR (CNMSDDCR)
 - Displays distributed DVIPA connection routing informations



Questions?



Thank You!