PerPLEXed about “mastering” your Enterprise?

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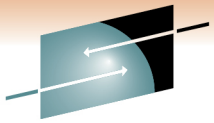
Agenda

- Sysplex and Enterprise Master Configuration
- Data Displayed at “Masters”
  - Discovery Manager Data Collection
  - DVIPA Data Collection
- User Interfaces Configuration
- Troubleshooting

Terminology

- “master” refers to both a sysplex master and enterprise master
- master or sysplex master refers only to sysplex master
- enterprise master will always be spelled out, except in the dual-case use



Sysplex and Enterprise Master Configuration

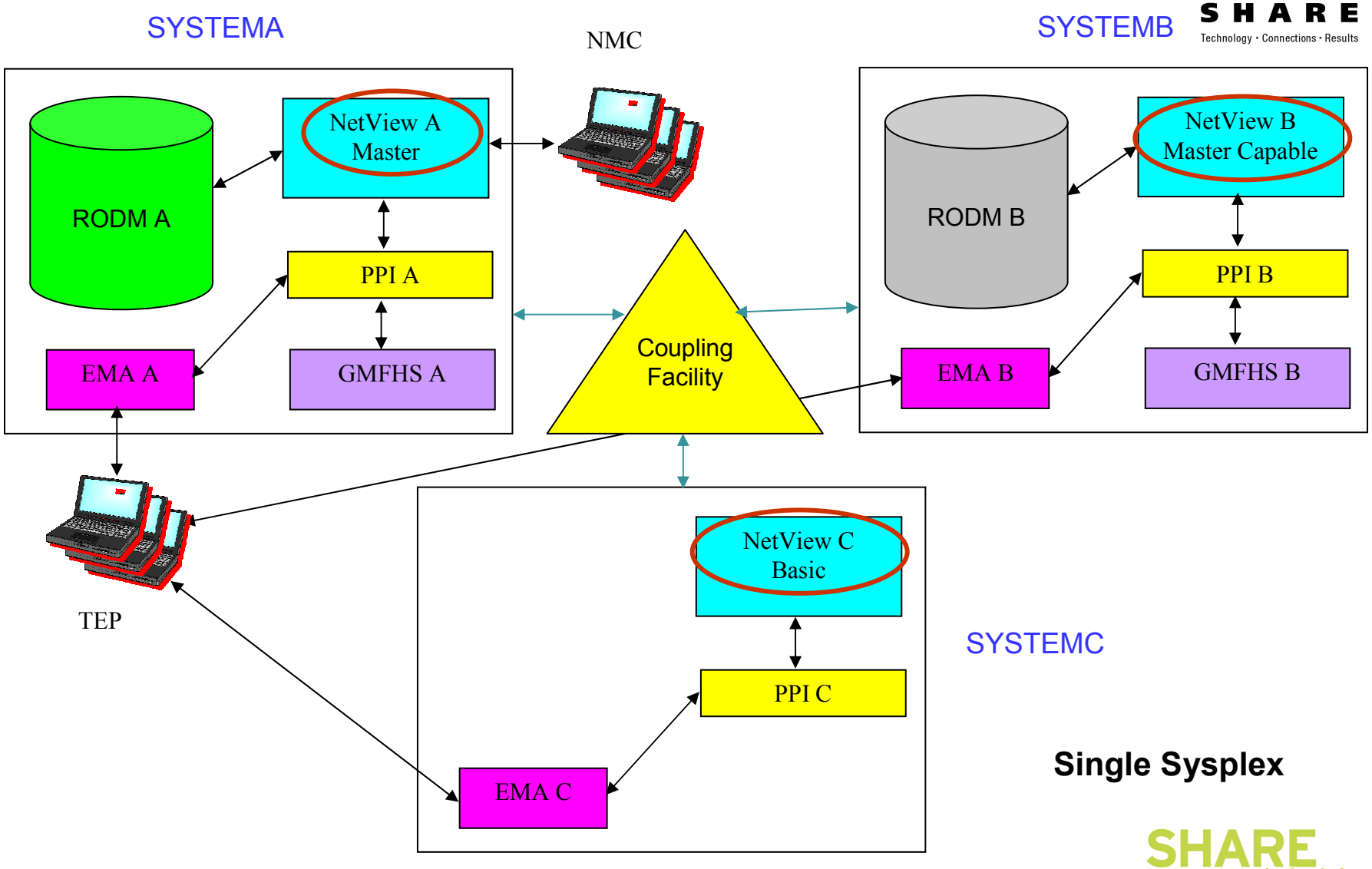
Enabling NetView to Manage a Sysplex

- Provides management from a single point of control for a "true" sysplex in NetView V5.4 (Master NetView)
- To achieve this:
  - Make NetView a sysplex application
  - Configure data collection
  - Configure user interfaces
- 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 (unless using NMC)

Sysplex Configuration with one Master NetView



Single Sysplex

XCF Services System Definition (XCF.RANK)

- Specify rank in NetView stylesheet
- 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

- Set XCF.RANK = 250 for system in the sysplex that you want to be the master.
- Also set XCF.RANK = 250 for monoplex systems.

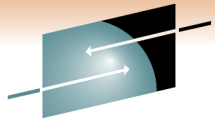
XCF Services System Definition (cont.)

- 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 (avoids 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.)

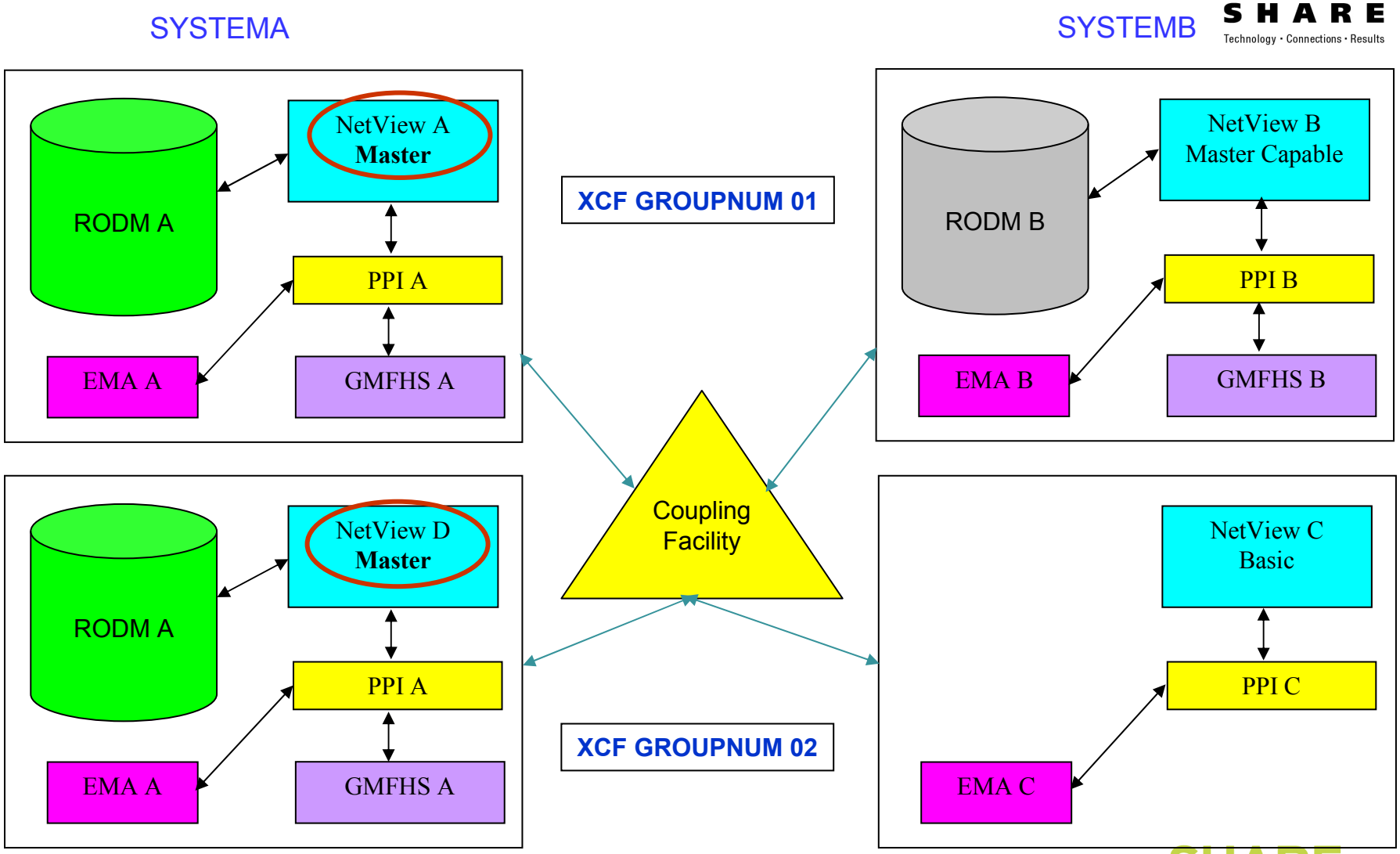
- XCF.TAKEOVER.DELAY = 0
  - Specifies how long to wait (in seconds) before attempting data discovery when NetView takes over as master. Valid values are 0 (the default) to 3600.
- XCF.TAKEOVER.NETCONVS = YES
  - Specifies whether a NetView taking over as master is to attempt to establish NETCONV connections/sessions 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 which NetView should attempt to establish NETCONV connections when taking over as master.
- XCF.PROCSTRxx
  - Specifies procedures that should be started when taking over as a master

XCF Services Configuration



XCF Parameter	SYSTEMA	SYSTEMB	SYSTEMC
RANK	250	100	1
GROUPNUM	01	01	01
PROCSTR01	*NONE*	RODM,TYPE=C,INIT= EKGLISLM	*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	

Sysplex Configuration with two Master NetViews

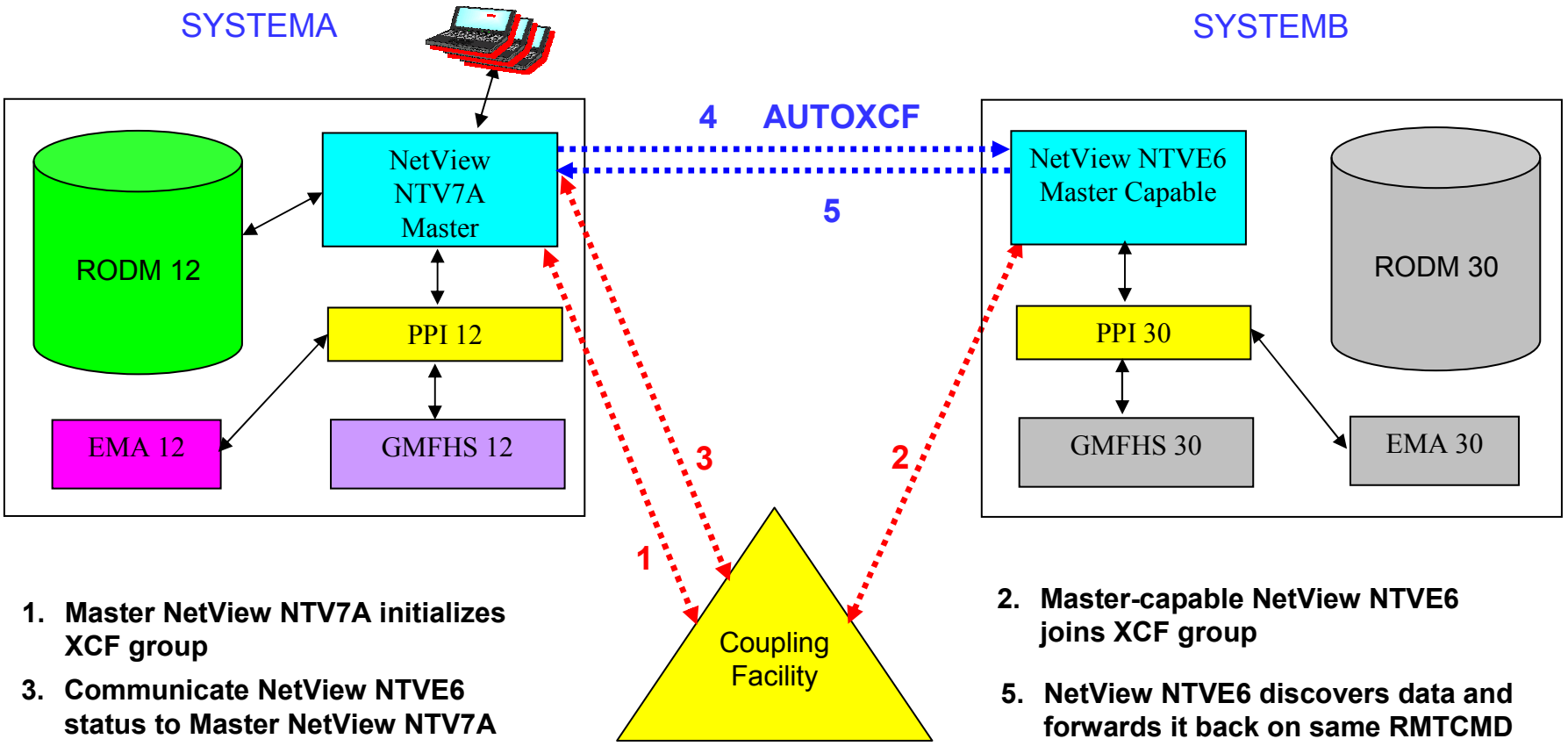


Single Sysplex

XCF Services Configuration

XCF Parameter	SYSTEMA	SYSTEMB	SYSTEMD	SYSTEMC
RANK	250	100	250	1
GROUPNUM	01	01	02	02
PROCSTR01	*NONE*	RODM,TYPE=C,INIT=EKGLISLM	*NONE*	*NONE*
PROCSTR02		GMFHS.C		
PROCSTR03		CANSNA		
INTWAIT	10	10	10	10
TAKEOVER.DURATION	5	5	5	5
TAKEOVER.CLIST	*NONE*	*NONE*	*NONE*	MONTHEND
TAKEOVER.DELAY	0	600	0	600
TAKEOVER.NETCONVS	YES	YES	NO	NO
TAKEOVER.CONVIP1	1.2.3.4/4022	1.2.3.4/4022		

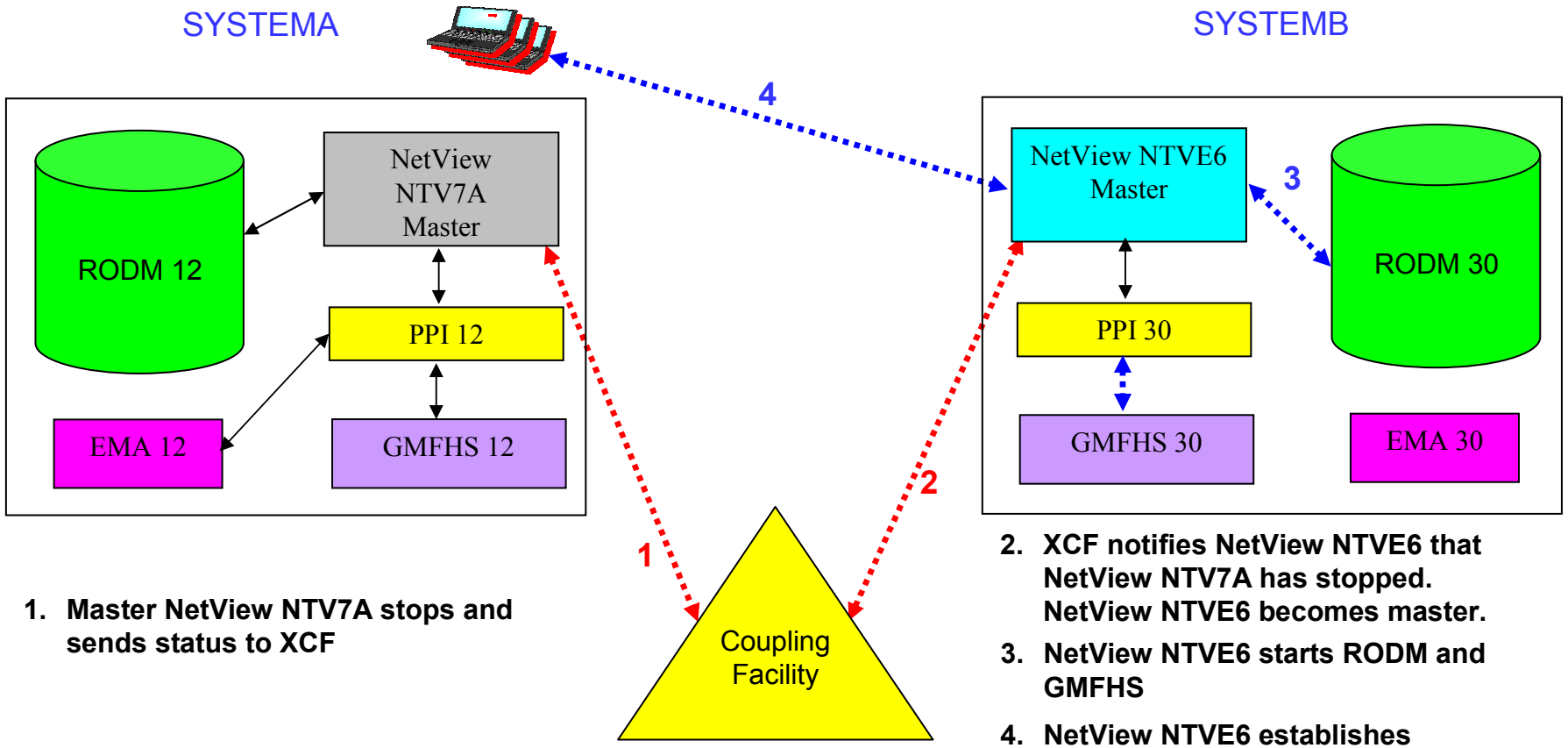
Master Initialization and Data Flow



1. **Master NetView NTV7A initializes XCF group**
3. **Communicate NetView NTVE6 status to Master NetView NTV7A**
4. **Master NetView NTV7A initiates RMTCMD to NetView NTVE6**

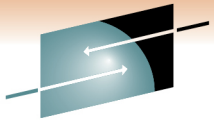
2. **Master-capable NetView NTVE6 joins XCF group**
5. **NetView NTVE6 discovers data and forwards it back on same RMTCMD connection started by NetView NTV7A**

Master NetView Failover



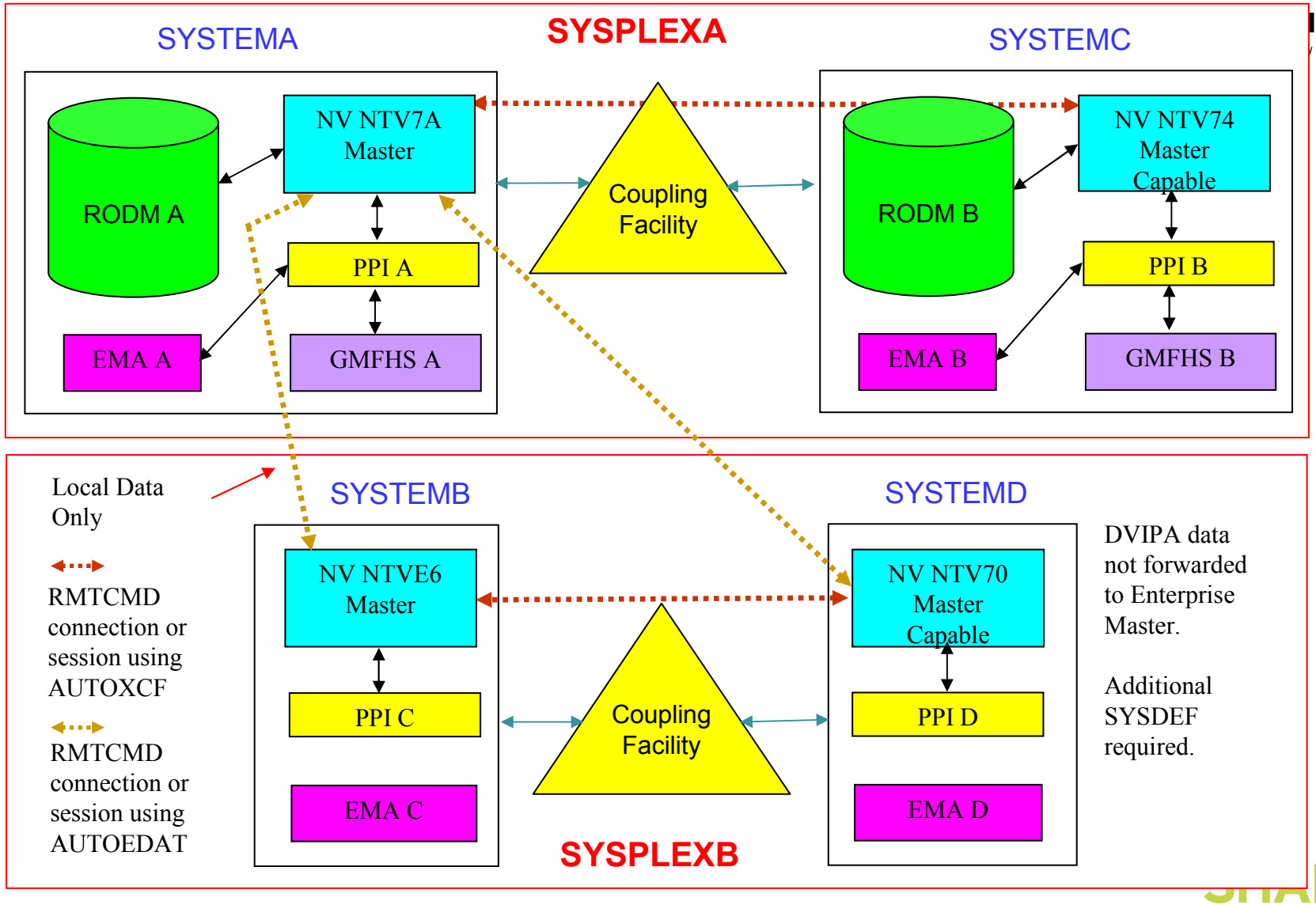
1. **Master NetView NTV7A stops and sends status to XCF**
2. **XCF notifies NetView NTVE6 that NetView NTV7A has stopped. NetView NTVE6 becomes master.**
3. **NetView NTVE6 starts RODM and GMFHS**
4. **NetView NTVE6 establishes NETCONV to NMC**
5. **NetView NTVE6 requests data from other NetViews in sysplex**

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

Enterprise Master NetView



Enterprise Master Configuration

- Sysplex A requires no extra configuration
  - RMTSYN and RMTALIAS definitions are dynamically generated as part of the sysplex master functionality

- Sysplex B has to be configured to report to the enterprise master in Sysplex A
  - RMTSYN and RMTALIAS definitions are required
    - Existing NetView definitions
  - ENT.SYSTEMS.*name* = alias definitions required
  - ENT.INT optional

Enterprise Master Configuration – ENT statements

- ENT.SYSTEMS.*name* = *alias*
  - Identifies entry points into sysplexes or standalone systems which will be managed.
    - *name* should correspond to the sysplex name for ease of use
    - *alias* is one or more defined RMTCMD aliases
- ENT.INT.*name* = *int*
  - Defines how long the enterprise master NetView will wait to issue the initial CNMEERSC command to the system. This is to prevent an overload on the NetView during NetView initialization.
    - Range 0-3600 seconds. Default 60 seconds.

Sample Enterprise Master Configuration

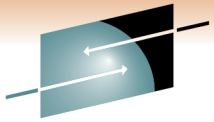
- RMTSYN.IP.NTVE6 = SYSTEMB.xxxxxx.COM/4022 ON USNETID
- RMTALIAS.NTVE6TST = IP.NTVE6
- RMTSYN.IP.NTV70 = SYSTEMD.xxxxxx.COM/4022 ON USNETID
- RMTALIAS.NTV70TST = IP.NTV70
  - Note: The second pair of RMTSYN/RMTALIAS definitions is not required, but is coded for backup.

- ENT.SYSTEMS.SYSPLEXB = NTVE6TST
- ENT.INT.SYSPLEXB = 120

Enterprise Master Notes

- Two enterprise master NetViews with the same ENT.SYSTEMS.name statement are not supported

- The only context for having a “backup” enterprise master NetView is when the enterprise master (also the sysplex master) fails over to another system in the sysplex.



Data Displayed at “Masters”

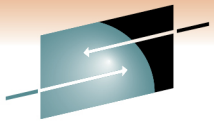
Data Displayed at “master” NetViews

- Discovery Manager data
  - Available at sysplex master and enterprise master NetViews
  - Provides Sysplex, Coupling Facility, z/OS Image, NetView application, TCP/IP Stack, TCP/IP subplex, IP Interfaces, Telnet server and port, OSA, and HiperSockets information

- DVIPA data
  - Available at sysplex master, but not at enterprise master NetViews (except for its local DVIPA data)
    - DVIPA information can be retrieved from the enterprise master for remote NetViews using 3270 commands
    - Provides DVIPA Definition and Status, Distributed DVIPA information, DVIPA connections, VIPA Routes, and DDVIPA connection routing

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 (DISCOVERY.NetViewOnly)
    - Prevents extra CPU utilization discovering identical resources



Discovery Manager Data Collection

Discovery Manager Overview

- Replaces Sysplex IP Stack Manager
  - Sysplex master NetView replaces the Resource Discovery Nucleus (meaning one RTNDEF.BASE.AGENT statement is coded)
- Data is forwarded to the master NetView based on participation in the master's XCF group
- Data is forwarded to the enterprise master once communication is established
  - An initial CNMEERSC command is sent from the enterprise master to the remote systems to synchronize displays

Enabling Discovery Manager

- Discovery Manager is enabled with towers and subtowers in CNMSTYLE
- SNMP
  - Ensure that DISCOVERY.SNMP = YES is configured
  - Prior to z/OS R11, SNMP is required for some data
  - At z/OS R11 or later, SNMP is required for:
    - IP interfaces
    - OSA
    - HiperSockets
- RODM is required for OSA and HiperSockets
- z/OS Communications Server V1R11 is required for HiperSockets

CNMPOLCY Configuration

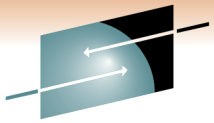
- It is not required to configure CNMPOLCY for Discovery Manager to discover remote TCP/IP stacks
- CNMPOLCY is dynamically updated at the master NetView with “discovered” TCP/IP stack information – requires APAR OA35773.
  - IPTRACE uses TCP/IP stack information discovered by Discovery Manager and stored in CNMPOLCY
- The SNMP community name does have to be configured for functions requiring SNMP; configure in:
  - CNMSCM
  - CNMPOLCY

Discovery Manager Data Summary

Data Discovered	Tower (or subtower)	Event or Sampled	Sampling Interval (seconds)	Autotask Name
Sysplex	DISCOVERY *	Event		AUTOAON
Coupling Facility	DISCOVERY *	Event		AUTOAON
z/OS Image	DISCOVERY *	Event		AUTOAON
NetView Application	DISCOVERY *	Event and Sampled	300	AUTOCT7
TCP/IP Stack	DISCOVERY *	Event		AUTOAON
TCP/IP Subplex	DISCOVERY *	Event		AUTOAON
TCP/IP Interface	DISCOVERY.INTERFACES	Sampled	3600	AUTOCT5
Telnet Server and Port	DISCOVERY.TELNET	Event and Sampled	3600	AUTOCT6

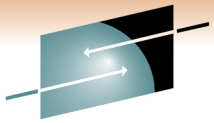
* Enabled by default

Discovery Manager Data Summary (cont.)



Data Discovered	Tower (or subtower)	Event or Sampled	Sampling Interval (seconds)	Autotask Name
OSA **	DISCOVERY.INTERFACES.OSA	Sampled	3600	AUTOCT5
HiperSockets ** (z/CS R11)	DISCOVERY.INTERFACES.HIPERSOCKETS	Sampled	3600	AUTOCT5

** Requires RODM



DVIPA Data Collection

DVIPA Discovery Overview

- Major changes since NetView V5.3 to provide better problem solving capability
- Data is forwarded to the master NetView based on participation in the master's XCF group
- DVIPA data can be updated using events
- DDVIPA statistics provide problem determination or historical information

Enabling DVIPA Discovery

- DVIPA is enabled with towers and subtowers in CNMSTYLE
  - Discovery for DVIPA Definition and Status does no longer uses the following configuration statements:
    - COMMON.CNMSTYLE.DVIPAINTVL = 01:00
    - COMMON.CNMSTYLE.DVIPAMAX = 256
- SNMP
  - Ensure that SNMP is configured if running z/OS R10 or earlier

DVIPA Discovery Data Summary

Data Discovered	Tower (or subtower)	Event or Sampled	Sampling Interval (seconds)	Autotask Name
DVIPA Definition and Status	DVIPA	Sampled and Event	3600	AUTOCT1
Distributed DVIPA	DVIPA.DVTAD	Sampled and Event	3600	AUTOCT2
* DVIPA Connections	DVIPA.DVCONN	Sampled	3600	AUTOCT3
VIPA Routes	DVIPA.DVROUT	Sampled and Event	3600	AUTOCT4
* DDVIPA Connection Routing	DVIPA.DVROUT	Sampled	3600	AUTOCT4

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

DVIPA Events

- DVIPA Events can be used to provide a better “real time” view of DVIPA information. NetView provides automation for three types of DVIPA Events:
  - DVIPA SNMP Traps (CNMSDVTP)
    - Uses NetView SNMP trap DST
  - DVIPA Configuration Changes (CNMSDVCG)
    - Requires z/OS V1R11 Communications Server
  - Sysplex Autonomics messages (CNMSSMON)
- DVIPA traps and DVIPA configuration changes can be generated for the same actions
- Uses autotask DVIPAUTO

DVIPA Event Processing

- When a DVIPA event is received:
  - NetView bundles the events using configurable delays
    - DVIPA.Event.Delay (default 60)
      - Number of seconds NetView will wait before notifying the master that DVIPA information needs to be rediscovered
  - Master is notified that this system needs rediscovering
    - The master NetView also has a delay to bundle the event messages
      - DVIPA.Mast.Disc.Delay (default 90)
        - Number of seconds the master NetView will wait to receive additional change notifications before requesting rediscovery
  - Master sends rediscovery commands to all systems in the sysplex impacted by the event
- Be careful about setting the delays to 0 – rediscovery could occur for each individual event.

DVIPA Traps Updates Configuration

- Update z/OS Communications Server snmpd.conf configuration file to send traps to NetView
- Start the SNMP agent
- Configure the NetView SNMP Trap Automation Task Configuration statements in CNMSTYLE and start the task
  - Use the same port on which traps are sent (default 162)
- To receive all traps, issue the following UNIX Systems Services commands:
  - Snmp – h *host* –r 0 –c *communityname* –v set ibmmvsdvipatrapcontrol.0 \'FC\'h

DVIPA TCP/IP Profiles Updates Configuration

- Add NETMON SMFSERVICE PROFILE statement to the TCP/IP profile

- Update an autotask in CNMSTYLE for each TCP/IP stack that is to collect VIPADYNAMIC TCP/IP profile updates
  - Function.autotask.TCPSM.stackname=AUTOTCPS
  - If DISCOVERY tower is disabled, then issue command TCPSM START TCPNAME=*tcpproc*

Configuration for Sysplex Monitoring Updates

- Update TCP/IP profile to include the SYSPLEXMONITOR GLOBALCONFIG statement. z/OS Communications Server will issue action messages when a problems occurs and a DOM when the problem is resolved.

- NetView will rediscover DVIPA information on receipt of the action message and the DOM

Distributed DVIPA Statistics

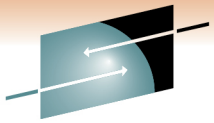
- Provides the capability to collect workload distribution for each distributed DVIPA target
  - Used for problem determination
  - Used for historical data
- Collects data after each DDVIPA discovery is done
- Starts during NetView initialization or using DVIPALOG command
- Writes data to a sequential data set
  - Primary and secondary data sets allocated
  - Messages indicate data set switching
- Sample CNMSDVST shows data in both data sets 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 Configuration

- Run the CNMSJ002 sample job to allocate primary and secondary data sets where data is written (CNMDVIPP and CNMDVIPS)
- Verify that the DVIPA DVTAD subtower is enabled
- To start logging at NetView initialization, set Init.DVIPSTATS CNMSTYLE statement to Y
- Update DVIPA statistics filter statements in CNMSTYLE
  - DVIPA.STATS.DVIPA
  - DVIPA.STATS.PORT
  - DVIPA.STATS.TCPNAMEz

DDVIPA Statistics Configuration cont.

- Update the DDVIPA statistics record count per data set CNMSTYLE statements (one record is written for each DDVIPA target for each data collection)
  - DVIPA.STATS.Pri.MAXR
  - DVIPA.STATS.Sec.MAXR
- Update DDVIPA “log to” location
  - DVIPA.STATS.LogTo
    - LocalOnly (Default)
    - Master
    - ALL (both local and master)
- Runs on autotask DVIPSTAT
- DDVIPA statistics can be started and stopped with the DVIPALOG command
  - Filters can also be specified on this command
  - Number of records must be updated in CNMSTYLE



User Interface Configuration

Discovery Manager User Interface Configuration

- Discovery Manager displays data in 3720, NMC, and the TEP
  - Appropriate data collection towers must be specified for all interfaces
- For NMC, the GRAPHICS tower must be enabled. RODM and GMFHS must also be running
- For TEP, the TEMA tower and the following subtowers must be enabled:
  - HEALTH – NetView application
  - SYSPLEX – Stack Configuration and Status
  - TELNET – Telnet Server Configuration and Status
  - OSA – OSA Channels and Ports
  - HIPERSOCKETS – HiperSockets Configuration and Status

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.)

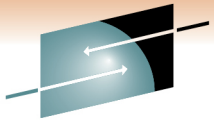
- OSAPORT (CNMSOSAP)
  - Displays OSA channel and port information
  - IOBSNMP must be running to collect OSA information
- HIPERSOC (CNMSHIPR)
  - Display HiperSockets status and configuration information

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

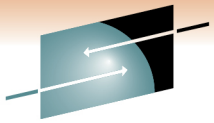
DVIPA User Interface Configuration

- DVIPA information is displayed in 3270 and the TEP
  - Appropriate data collection towers must be specified for all interfaces
- DDVIPA Statistics also writes raw data to data sets
- For TEP, the TEMA tower and the following subtowers must be enabled:
  - DVDEF – DVIPA Definition and Status
  - DVTAD – DDVIPA information
  - DVCONN – DVIPA Connections
  - DVROUT – VIPA Routes and DDVIPA Connection Routing

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



Troubleshooting

Troubleshooting the “Master” Environment

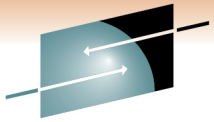
- Missing data from one or more domains on the “master”
  - Issue the 3270 command with the DOMAIN keyword for the pertinent data. If no data returns, then ensure:
    - Data collection is correctly enabled
    - Data collection is active (COLLCTL command)
    - SNMP is active, if necessary
    - No errors in the NetView log
  - Make sure that automation is enabled on the remote systems and “master”
    - CNMSEPTL – Discovery Manager
    - CNMSDVDS – DVIPA (base data collection)
    - CNMXSCFA – master automation
  - Verify that the NetView domain shows up in the LIST STATUS=XCFGRPS command output, when issued at the “master”

Troubleshooting the “Master” Environment (cont.)

- Missing data from one or more domains on the “master” cont.
  - Browse CNMALLDA on the “master” for Discovery Manager for your domain information
  - Browse CNMDVPST on the sysplex master for DVIPA – look for your domain name

Troubleshooting the “Master” Environment (cont.)

- Data not showing up in NMC or TEP
  - Verify that configuration for each user interface has been done appropriately
  - For TEP, verify that the NACMD connection is active – use the NACTL LISTCONN command for verification



THANK YOU!

SHARE in Anaheim 2011