Troubleshooting System P Agents

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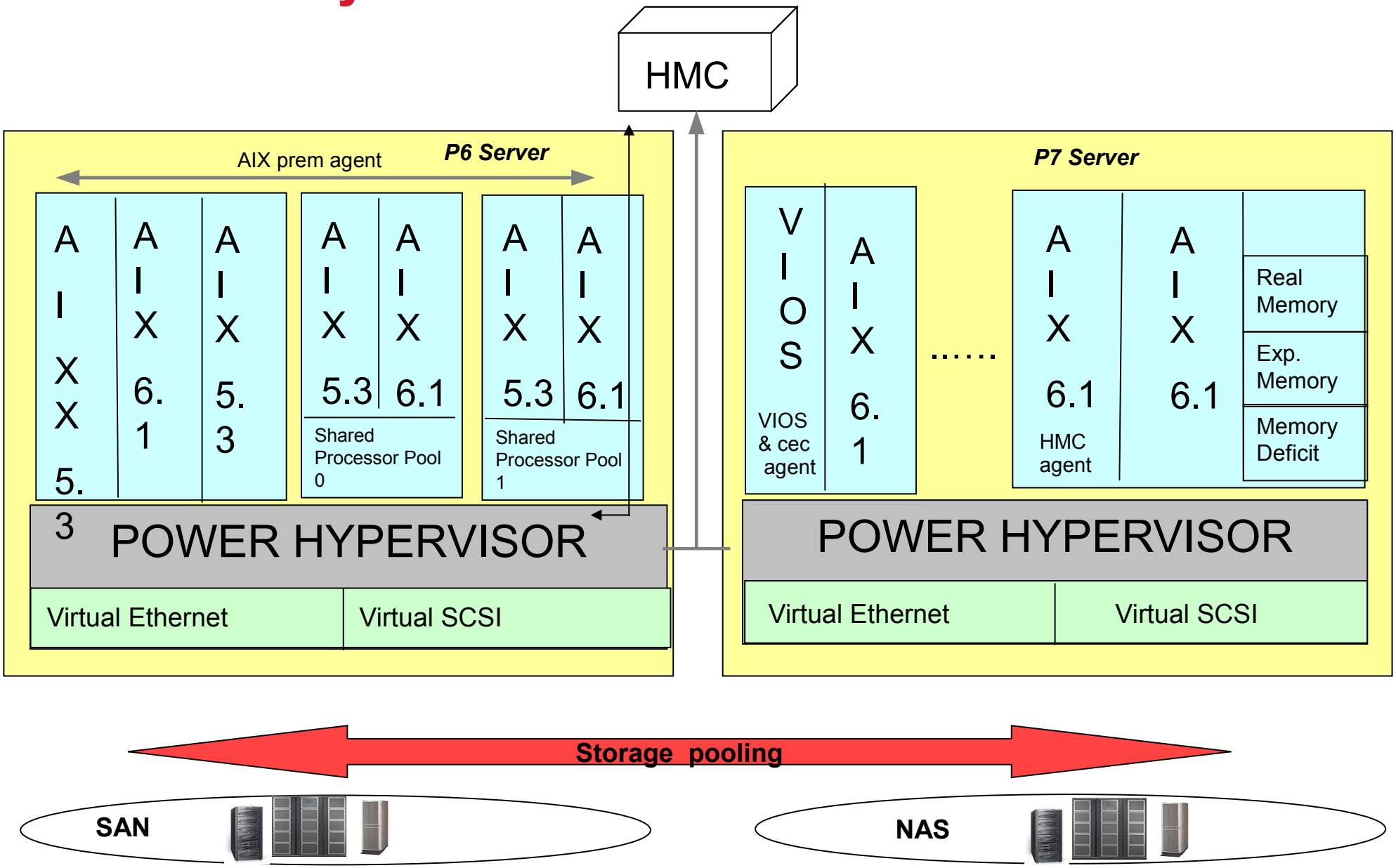
AIX/Power Systems Architecture: Internals



AIX premium agent – Troubleshooting

- Sources of data collection
  - SPMI shared libraries
    - CPU, memory, process etc
  - Perl script (aixDataProvider.pl)
    - Network, Logical Volumes, Print Queues etc

- Data Collection – No data found in the TEPS:
  - Are the aixDataProvider and the kpxagent processes running?
  - Is there a core dump?
    - #errpt -a will indicate a core dump
    - #snapcore <path to the core> $CANDLEHOME/aix523/px/bin/aixDataProvider
  - Can the data Provider be started without the agent?
    - #export LIBPATH=$CANDLEHOME/tmaitm6/aix523/lib
      #$CANDLEHOME/aix523/px/bin/aixDataProvider &

AIX Premium Agent - Troubleshooting

- Data Collection – Bad Data
  - Data Provider traces usually display the data that is being collected from SPMI libraries. Below are some snippets:

```
---------------------
regMetricGroup: Copying <LPAR/lcpu> into slot 0
regMetricGroup 1: Copying <LPAR/lcpu> into slot 0
regMetricGroup: stat_counter 1 loop = 1
.....
get_SPMI_values: entered
---------------------
And below, the values collected:
---------------------
Data Packet Time Mon Feb  6 15:17:44 2012
get_values: entered
SpmiGetValue: 4.00
---------------------
```

AIX premium agent – Troubleshooting

Tracing through the aixDataProvider and kpxagent logs:
In the hostname_px_aixDataProvider-61_*.log

```
--------------------
4F304378.0003-1:aixtranslator.c,1899,"dt_RefreshStatSet") 14 initial SPMI pathnames for the
'CPU_Summary' attribute group:
(4F304378.0004-1:aixtranslator.c,1901,"dt_RefreshStatSet")   'LPAR/lcpu'
…
…
(4F304378.0012-1:aixtranslator.c,1902,"dt_RefreshStatSet") 14 expanded SPMI pathnames for
the 'CPU_Summary' attribute group:
(4F304378.0013-1:aixtranslator.c,1907,"dt_RefreshStatSet")   'LPAR/lcpu' -> 4.000000
--------------------
```

For metrics being collected by the Perl script, the script can be run outside of the agent to verify the values:

```
# ./aixDataProvider.pl Physical_Volumes
----------------------
hdisk0,active,rootvg,3,0,139776,38656,101120,28,72,2B08008304B50FHUS151414VL380008IBM    H0scsi
hdisk1,active,rootvg,5,0,139776,105472,34304,75,25,2B08008379630FHUS151414VL380008IBM    H0scsi
hdisk2,active,rootvg,4,0,139776,108288,31488,77,23,2B08008325A30FHUS151414VL380008IBM    H0scsi
hdisk3,active,rootvg,5,0,139776,134912,4864,97,3,2B08008325700FHUS151414VL380008IBM    H0scsi
----------------------
```

CEC Agent - Troubleshooting

- Communication with the HMC
  - On an AIX lpar, $CANDLEHOME/aix523/pk/bin/key.pl script can be run to establish communication with the HMC.
    - Note: The key.pl script looks for openssh.base.client
  - On a VIOS lpar, the cfgsvc command creates a key pair. Manually authorize HMC to allow a connection.
    - Configure secondary HMC on VIOS second_managing_system=<hmcuser>@<host name of the secondary HMC>. fix for APAR: IV03965 is required. http://www-01.ibm.com/support/docview.wss?uid=swg21424888
  - Successful connection to the HMC - the data provider log shows:

```
----------------------
check_hmc_version: cmd = </usr/bin/ssh -l hscroot tapshmc.tivlab.raleigh.ibm.com "lshmc -V | grep
Version | cut -d: -f2" 2>/dev/null>
gather_hmc_info: Grt 5
check_hmc_version: cmd = </usr/bin/ssh -l hscroot tapshmc.tivlab.raleigh.ibm.com "lshmc -V | grep
Version | cut -d: -f2" 2>/dev/null>
CEC viover = <2.2.0.0>

HMC Version: 7
----------------------
```

CEC Agent - Troubleshooting

- Communication with the HMC
  - Manually verify the connection to the hmc:
    - #ssh <hmc-user>@<hmc-hostname> “lshmc -V”
      returns the HMC version without prompting for a password.

- After HMC communication is established – Next steps:
  - Obtains hardware resources for the cec:
    - lshwres -m \"cec-name\" -r proc --level sys

      CEC_CPU_Alloc= 6.000000 CEC_CPU_Unallocated= 0.000000 CEC_CPU_Total= 6.000000
      CEC_CPU_Alloc_Pct= 100.00 CEC_CPU_Unallocated_Pct= 0.00 execute_procHMCstruct: CPU_Alloc=
      6.000000 CPU_Unallocated= 0.000000 CPU_Total= 6.000000
      getHMC_procstat6V: avail 6.0 unavail = 0.0 execute_procPoolHMCstruct: CPU_Shared_PoolSize
      6.0

  - Gets a list of lpars on cec to contact them individually
    - lssyscfg -r sys -m \"Power750-1\" -F type_model,serial_num
      lspartition -c \"8233-E8B_106ED9P\"

      Executing cmd /usr/bin/ssh -l hscroot hmc-name "lssyscfg -r sys -m \"cec-name\" -F type_model,serial_num "
      CEC Model Number 9110-510,102B3FF
      get_lspartition cmd2 /usr/bin/ssh -l hscroot hmc-name "lspartition -c \"9110-510_102B3FF\" "
      lsPart Scan1 <#1> Partition:<3, tapslpar2p.raleigh.ibm.com, 9.42.153.128>
      …
      …
      ...

CEC Agent - Troubleshooting

- Unmonitored LPARS (communication with individual lpars)
  - xmtopas needs to be running on all the lpars (including cec agent lpar)
  - UDP port 2279 needs to be opened
  - #topas -C should yield a list of lpars
  - If the above conditions are satisfied, data provider logs provide a clue as to what is wrong:

```
-------------------------
TIME: Mon Feb  6 13:23:13 2012 Leaving FEED host = <tapslpar>
TIMEL Error:  Mon Feb  6 13:23:15 2012 Unable to Open Lpar-first attempt <9.42.153.154>
DEBUG: RSiErrno = 280
TIMEL Error:  Mon Feb  6 13:23:20 2012 Unable to Open Lpar-second attempt <9.42.153.154>
DEBUG: RSiErrno = 280
TIMEL Error:  Mon Feb  6 13:23:25 2012 Unable to Open Lpar-third attempt <192.168.6.188>
DEBUG: RSiErrno = 280
-------------------------
```

  - RsiErrno=280 implies that the cec agent attempted communicating to the lpar, but did not receive a response.

Note: topas and the cec agent don't use the same logic to communicate with lpars

CEC Agent - Troubleshooting

- Another RSiErrno snippet

```
----------------------------------------
Calling open_lpar with host tapslpar <>
TIMEL Thu Oct 20 11:49:41 2011 Calling open_lpar: hostname =
Domain = .raleigh.ibm.com
open_lpar: for index 0 <tapslpar> <>
TIMEL: Thu Oct 20 11:49:41 2011 Before OPEN for
Attempting RSiOpen for rh_index: 0
TIMEL Error:  Thu Oct 20 11:49:41 2011 Unable to Open Lpar-first attempt<>
DEBUG: RSiErrno = 288
TIMEL Error:  Thu Oct 20 11:49:41 2011 Unable to Open Lpar-second attempt <>
DEBUG: RSiErrno = 288
TIMEL Error:  Thu Oct 20 11:49:41 2011 Unable to Open Lpar-third attempt <>
DEBUG: RSiErrno = 288
----------------------------------------
```

- Notice above that the full hostname is missing
- IP address of the hostname is missing.
- RsiErrno=288 indicates a wrong parameter being passed.
- HMC needs to be configured to resolve IP addresses and hostnames.

CEC Agent - Troubleshooting

- Data for LPARS - “Not collected”
  - Typically an SPMI problem
  - Logs show:

```
------------------------------------------------------------------
FEED IS FROM <tapslpar.raleigh.ibm.com> lv=9
partition_feed: hostname= tapslpar is_capped_val= -1 is_shared= ÿ       is_shared_val=-1
partition_feed: onlinemem= 12288 realsize= 3145728 is_smt= ÿ           is_smt_val=-1 is_capped= ÿ
smt_thrds = -1
partition_feed: vcpu = 2
partition_feed: pcpu= -1.0     user= -1.0     kern= -1.0     wait=-1.0
   idle= -1.0
partition_feed:ent= -1.0       entc= -1.0       app=-1.00 pcpuinpool=
16.0 lcpu=  4.0
   partition_feed: osver_str= AIX6.1 max_cpu_cap_Pct = -1.00
   partition_feed: pbusy= -1.0     lbusy=     -1.0
   partition_feed:osver=6.10     is_shared= ÿ physb= -1.4
inuse=3112859 vcsw= -1.00
partition_feed: phi= -1.00 weight = 200.00
 ------------------------------------------------------------------
```

  - Negative numbers for metrics collected from libSPMI indicate that the agent is not receiving correct data from libSPMI.
- Additional details related to configuring agent on VIOS are dealt with in the VIOS section.
- Additional Tools
  - ptxrlog

VIOS Agent - Troubleshooting

- AixDataProvider-61 binary is the same for VIOS and AIX premium agents
- In addition - Network & Storage mappings from the HMC
  - aixDataProvider.pl Storage_Mappings
  - aixDataProvider.pl Network_Mappings
- Common Configuration Issues:
  - cfgsvc command fails on VIOS version 2.2.0.12-FP-24 SP-02 or VIOS 2.2.0.13-FP-24 SP03:
    http://www-01.ibm.com/support/docview.wss?uid=swg21501447
  - To configure the agent on VIOS:
    http://www-01.ibm.com/support/docview.wss?uid=swg21432003
    Note: Running key.pl in VIOS does not configure the agent correctly
  - Agents do not match the level VIOS (APAR IZ82947):
    http://www-01.ibm.com/support/docview.wss?uid=swg21448092
    Fixed in VIOS 2.2.1.0

HMC Agent - Troubleshooting

- Runs on any AIX Lpar
- Requires ssh communication to the HMC that is being monitored
- Multi-instance agent
- User need not be hscroot in some of the later versions
  - Note: HMC Viewer permission required for the HMC user
- Possible to invoke the hmcDataProvider process to check if it starts and runs:

```
$export HMC_HOSTNAME=<hostname>
$export HMC_USERNAME=<hscroot>
$export LIBPATH=/opt/IBM/ITM/tmaitm6/aix523/lib
$hmcDataProvider -d
```

Logs and trace requirements

- Any kind of data related problem
  - Detailed data provider traces
  - pdcollect ($CANDLEHOME/bin/pdcollect)
  - Logs and trace settings vary depending on the version.
    - https://www.ibm.com/developerworks/mydeveloperworks/wikis/home?lang=en#SystemPAgents-CommonTracing
- Data Provider cores
  - snapcore is required in addition to traces
- Sometimes a snap is also helpful
  - snap -r (answer yes if asked)
  - snap -gGik
  - snap -c
- Screenshots if applicable

Identifying SPMI problems - TIPS

- Data for several metrics for AIX premium, CEC and VIOS agents come from SPMI shared libraries.

- First step for every dataProvider – Initalize SPMI.
  - SPMI Logger code present in /usr/samples/perfagent/tools
  - Can be compiled and used to check if SPMI initalizes outside of the agent

- APARs that affect System P agents (not released in a fix pack yet):
  - IV04968: Running a spmi consumer e.g. ITM can show up symptoms like:

    "Spmi: Common Memory locked by process 499712, requestor: 491768
    (SiInit)ERROR: Unable to initialize SPMI interface."

    The above message can be found in the hostname_pc_<hextimestamp>.log file.
    Above
    * pc = product code
    Typically, the agent does not display any data in the portal.

Identifying SPMI problems - TIPS

- APARs that affect System P agents (not released in a fix pack yet) contd...
  - IV04882: Running an spmi consumer e.g. ITM can show up symptoms like:

    "Spmi: Common Memory locked by process 499712, requestor: 491768 (SiInit)ERROR: Unable to initialize SPMI interface."

  - IV08573 SPMI:Incorrect CPU usage if LPAR IS 'dedicated' and 'donating'

Identifying SPMI problems - TIPS

Symptom – No data seen in the portal

- Is the dataProvider (aixDataProvider-61 / cecDataProvider) process running?

  Can the dataProvider be started independently

```
-----------------
  # export LD_LIBRARY_PATH=$LD_LIBRARY_PATH:/opt/IBM/ITM/aix523/ui/lib
  # export LIBPATH=$LIBPATH:/opt/IBM/ITM/tmaitm6/aix523/lib
  # ./aixDataProvider &
  [1]     11927642
  # ps -ef | grep aixData
  root  2490474 12058648   0 13:21:34  pts/0  0:00 grep aixData
  [1] +  Done(1)                ./aixDataProvider &
-----------------
```

  Is there a core dump? (Need a snapcore to analyze)

- Enable detailed data Provider logs. Details can be found in:

https://www.ibm.com/developerworks/mydeveloperworks/wikis/home?lang=en#SystemPAgents-CommonTracing

Identifying SPMI problems – Tips ...

- Known SPMI issues with data Provider process not starting
  - SPMI apar: IZ78692 – Problem allocating memory

    http://www-01.ibm.com/support/docview.wss?uid=swg21443608

    Log messages show:

    ERROR createStatSet: Spmi: Memory allocation error

    (SiCreateStatSet)ERROR createStatSet: Spmi: Memory allocation error

    ---

  - APAR: IZ89719

    If agent is being started by a non-root user, check for the file: /tmp/Spmi.lock

    Should be owned by user starting the agent and should have permissions: -rwSr--r--

    - http://www-01.ibm.com/support/docview.wss?uid=swg21459909

Historical Collection & Reporting

- Data Collection
  - Agent Or
  - TEMS
- History directory controlled by variable in xx.ini file:
  - CTIRA_HIST_DIR
- Metafile (*.hdr files) and the attribute data stored in History directory as specified above
- To determine last transfer of data to warehouse:
  - #strings $CTIRA_HIST_DIR/khdexp.cfg
- Default reports only ship for VIOS and CEC agents
  - Known issue: IV13173
    Reports don't work if cec agent monitors a remote CEC

Resources

- http://publib.boulder.ibm.com/infocenter/tivihelp/v15r1/topic/com.ibm.itm.doc_6.2.2/paix6221_user.pdf
- http://publib.boulder.ibm.com/infocenter/tivihelp/v15r1/topic/com.ibm.itm.doc_6.2.2/pcec6221_user.pdf
- http://publib.boulder.ibm.com/infocenter/tivihelp/v15r1/topic/com.ibm.itm.doc_6.2.3/pviosagent6222_user.pdf
- http://publib.boulder.ibm.com/infocenter/tivihelp/v15r1/topic/com.ibm.itm.doc_6.2.2/phmc6221_user.pdf
- Developer works wiki
  - https://www.ibm.com/developerworks/wikis/display/tivolimonitoring/System+P+Agents
- Reports:
  - http://www.youtube.com/watch?v=L6dqRGem3WQ
  - http://www.youtube.com/watch?v=H_6g_oXpahM

QUESTIONS?