Introduction to zVPS

- **Barton@VelocitySoftware.com**
- **HTTP://VelocitySoftware.com**

"If you can't Measure it,
I am Just Not Interested ™"

Velocity Software - Products

- **ZVPS - “z” Velocity Performance Suite**
  - Performance Management for z/VM, Linux, z/VSE, z/OS
  - Performance Management for Applications such as MongoDB, Oracle, Docker, and more
  - zVIEW Demo - http://demo.VelocitySoftware.com/zview
- **zTUNE (Performance guidance, health checking)**
- **zPRO: Cloud Enablement Technologies**
  - zPRO, (Cloud enablement for Linux, z/VSE, z/VM)
  - Broadcom replacements
  - VMWare replacements
  - zPRO Demo - http://demo.VelocitySoftware.com/zpro
- **zVRM: Velocity Resource Manager**

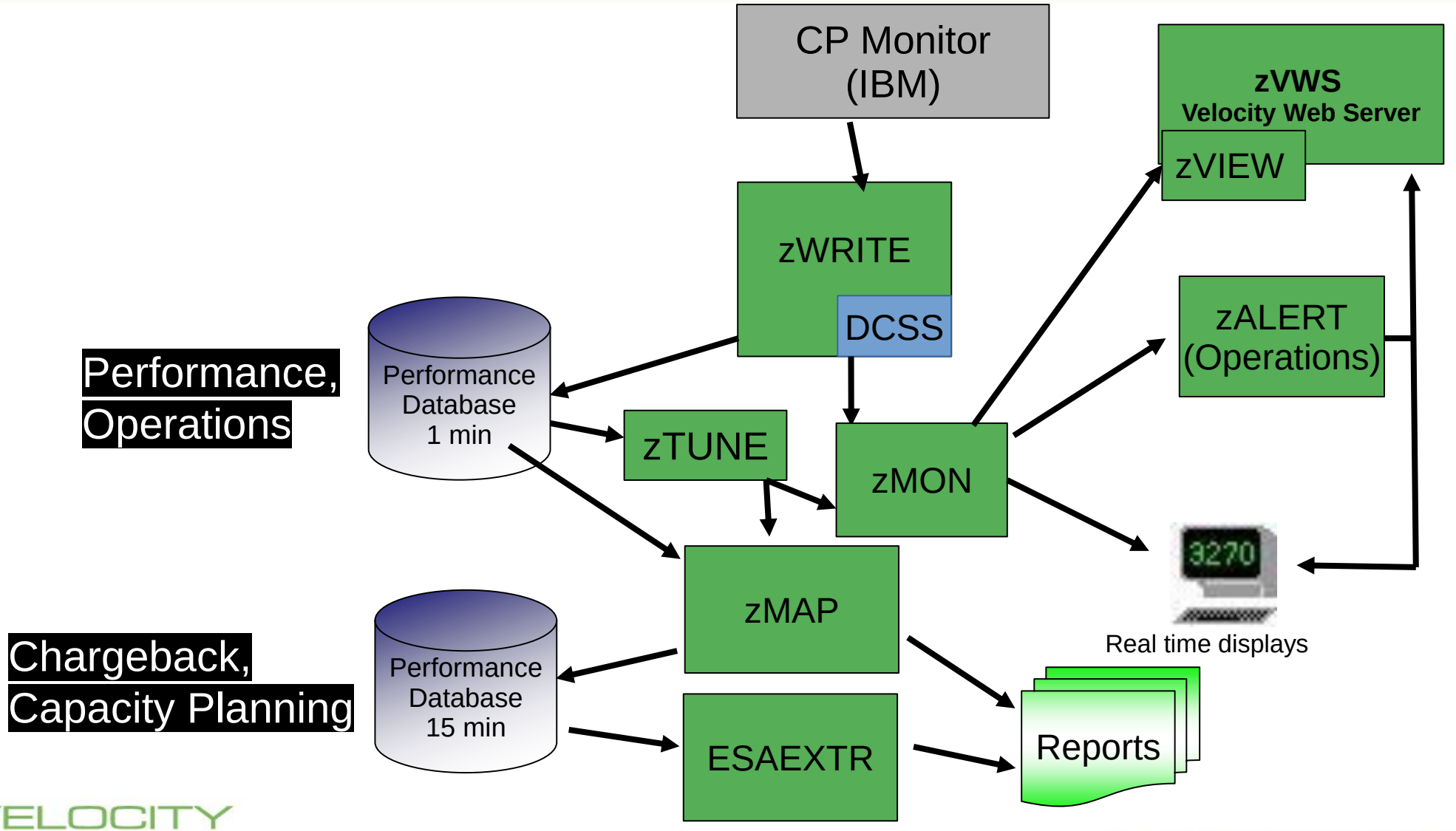
Infrastructure Requirements

- **Performance Management Requirements**
  - Performance Analysis
  - Operational Alerts
  - Capacity Planning
  - Accounting/Charge back
- **Correct data (Virtual Linux CPU - data wrong)**
- **Capture ratios**
  - When numbers do not agree
  - Which data is valid?
- **Instrumentation can NOT be the performance problem**

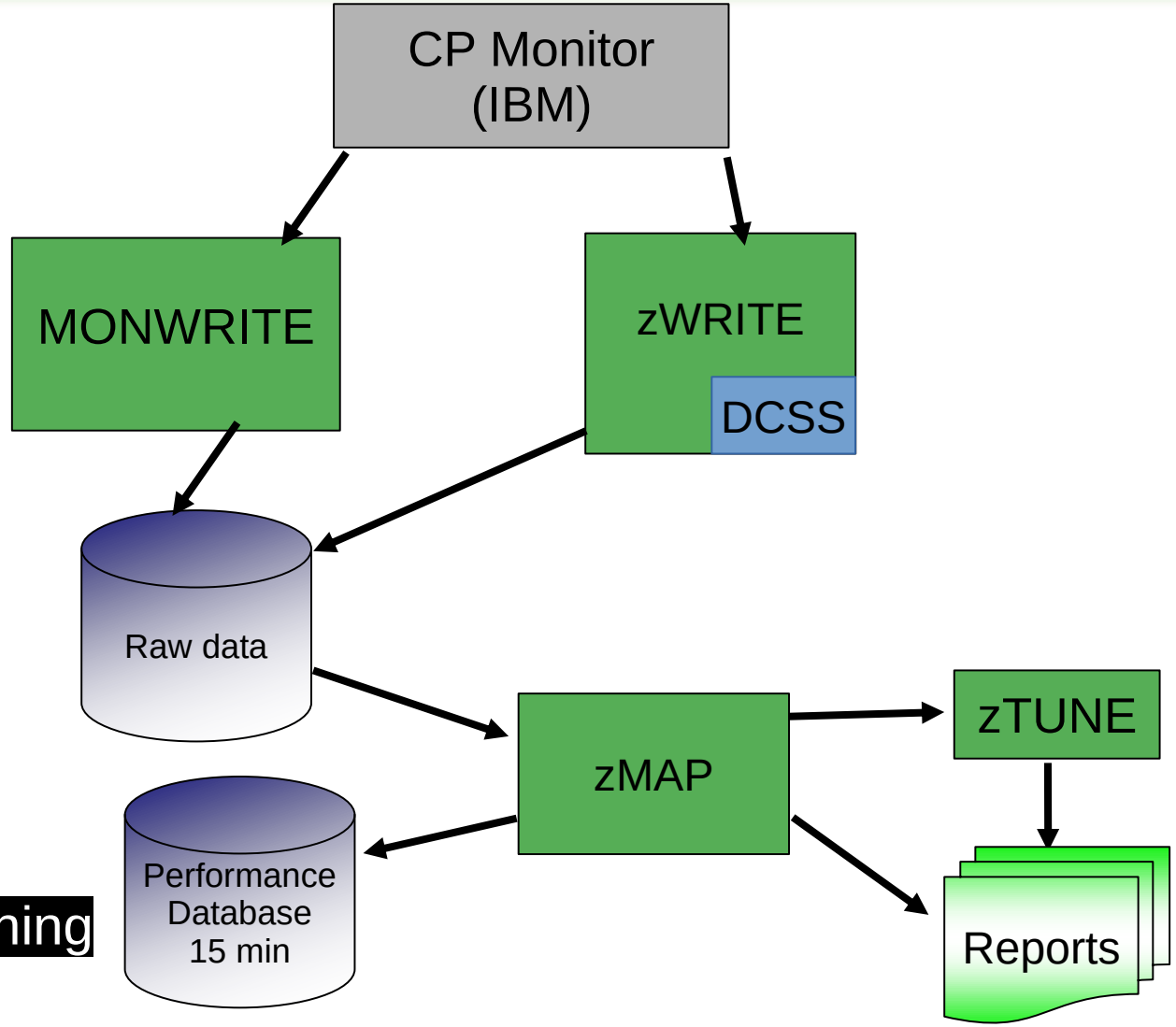
zVPS Does “End to End” Performance Management

- **Management wants**
  - “A single pane of glass” - One tool that does all
- **Complete performance management includes:**
  - z/VM System Level: CEC, LPAR data, ALL SubSystems
  - Linux – Storage, CPU, file system, network
  - Process – Applications, performance data
  - VSE – Partitions, CPU, I/O (CICS)
  - z/OS – (CICS, DB2)
- **Network analysis**
- **Linux Application subsystem analysis**
  - Java, WAS, Oracle, MQ, DB2, postgres, GPFS
- **Outside “z” server analysis**
  - Linux on “x”, VMWare, **KVM**
  - Microsoft servers
  - VPN, gateways, utilities

zVPS Infrastructure



zVPS and “Raw Data”

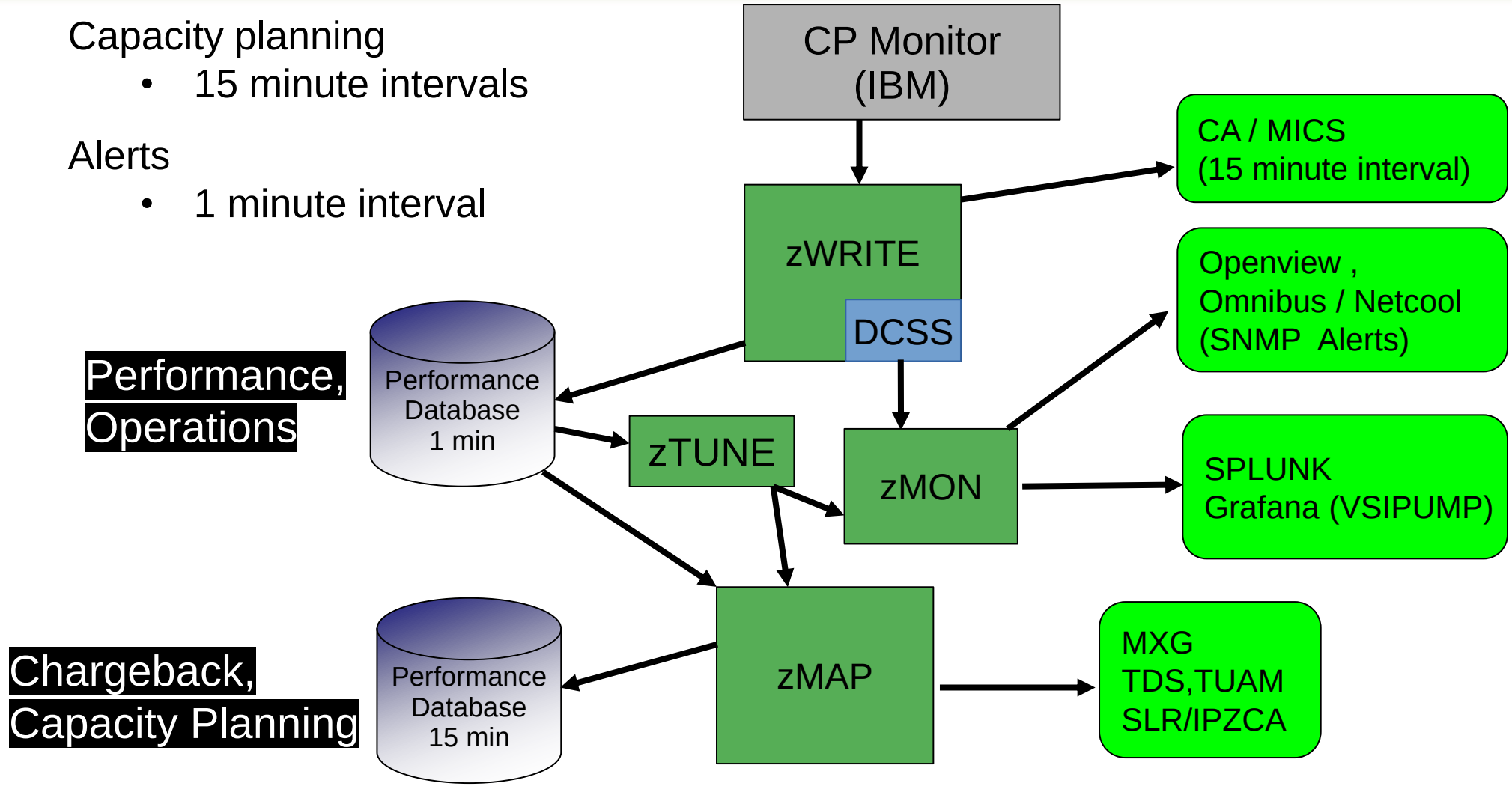


Chargeback,
Capacity Planning

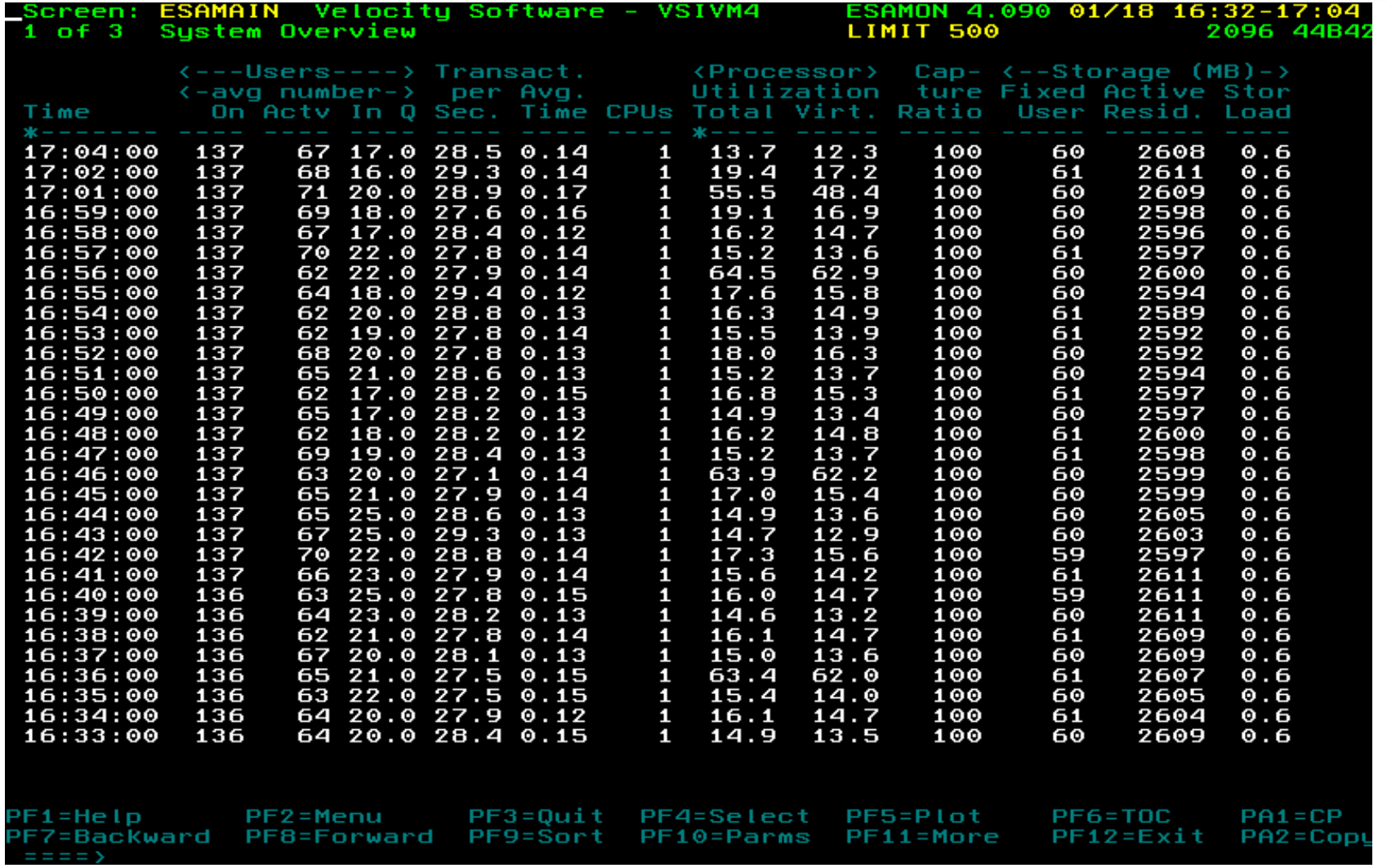
“Play Nice” Pump Support

Capacity planning
- 15 minute intervals

Alerts
- 1 minute interval



zMON 3270 Overview

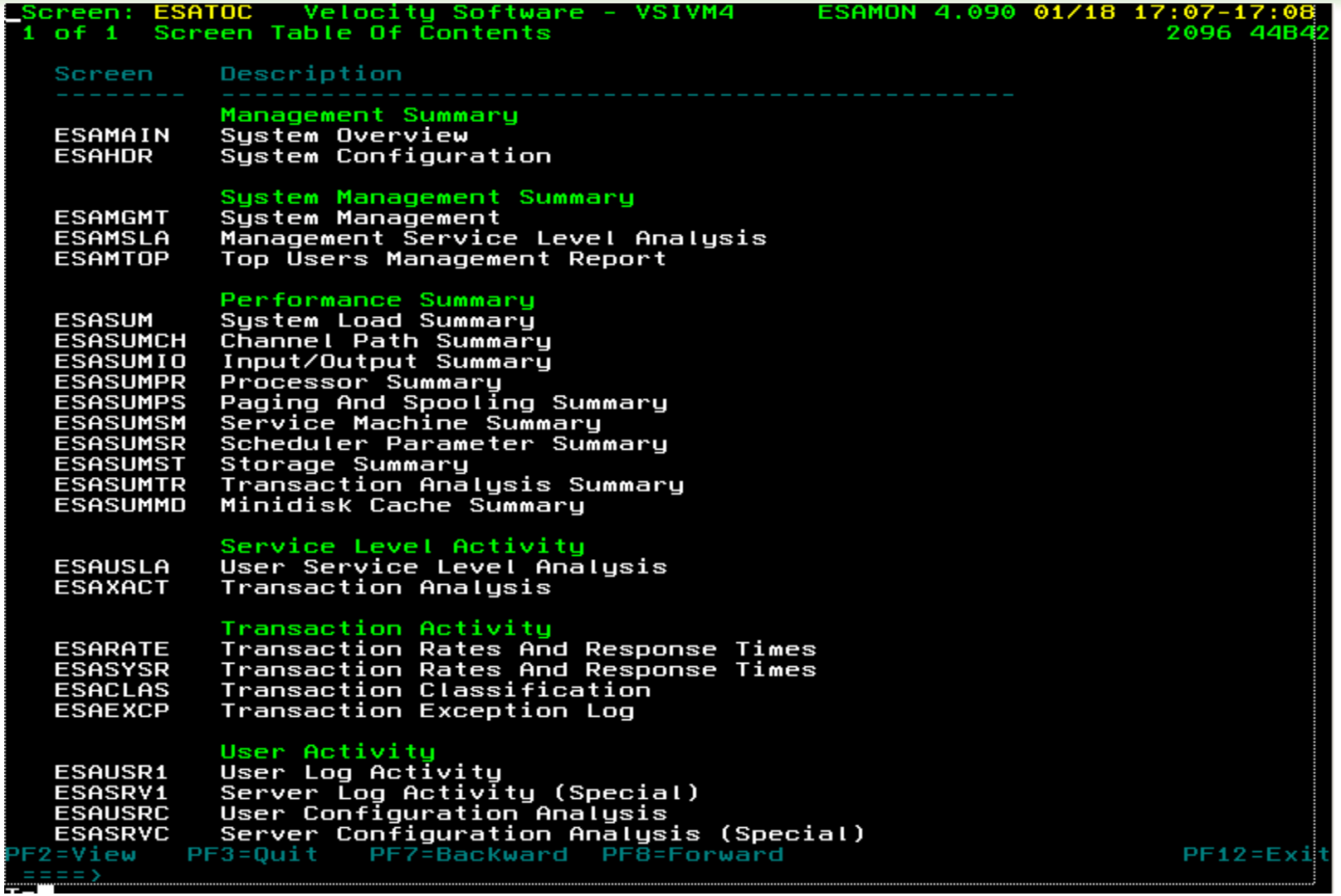


```
Screen: ESAMAIN  Velocity Software - VSIVM4      ESAMON 4.090 01/18 16:32-17:04
 1 of 3  System Overview                          LIMIT 500              2096 44B42

          <---Users----> Transact.          <Processor>  Cap-  <--Storage (MB)->
          <-avg number->  per Avg.          Utilization  ture Fixed Active Stor
 Time       On Actv In Q Sec. Time CPUs Total Virt. Ratio  User Resid. Load
 *------- ---- ---- ---- ---- ---- ---- *---- ----- ----- ----- ------ ----
 17:04:00  137   67 17.0 28.5 0.14    1  13.7  12.3   100    60   2608  0.6
 17:02:00  137   68 16.0 29.3 0.14    1  19.4  17.2   100    61   2611  0.6
 17:01:00  137   71 20.0 28.9 0.17    1  55.5  48.4   100    60   2609  0.6
 16:59:00  137   69 18.0 27.6 0.16    1  19.1  16.9   100    60   2598  0.6
 16:58:00  137   67 17.0 28.4 0.12    1  16.2  14.7   100    60   2596  0.6
 16:57:00  137   70 22.0 27.8 0.14    1  15.2  13.6   100    61   2597  0.6
 16:56:00  137   62 22.0 27.9 0.14    1  64.5  62.9   100    60   2600  0.6
 16:55:00  137   64 18.0 29.4 0.12    1  17.6  15.8   100    60   2594  0.6
 16:54:00  137   62 20.0 28.8 0.13    1  16.3  14.9   100    61   2589  0.6
 16:53:00  137   62 19.0 27.8 0.14    1  15.5  13.9   100    61   2592  0.6
 16:52:00  137   68 20.0 27.8 0.13    1  18.0  16.3   100    60   2592  0.6
 16:51:00  137   65 21.0 28.6 0.13    1  15.2  13.7   100    60   2594  0.6
 16:50:00  137   62 17.0 28.2 0.15    1  16.8  15.3   100    61   2597  0.6
 16:49:00  137   65 17.0 28.2 0.13    1  14.9  13.4   100    60   2597  0.6
 16:48:00  137   62 18.0 28.2 0.12    1  16.2  14.8   100    61   2600  0.6
 16:47:00  137   69 19.0 28.4 0.13    1  15.2  13.7   100    61   2598  0.6
 16:46:00  137   63 20.0 27.1 0.14    1  63.9  62.2   100    60   2599  0.6
 16:45:00  137   65 21.0 27.9 0.14    1  17.0  15.4   100    60   2599  0.6
 16:44:00  137   65 25.0 28.6 0.13    1  14.9  13.6   100    60   2605  0.6
 16:43:00  137   67 25.0 29.3 0.13    1  14.7  12.9   100    60   2603  0.6
 16:42:00  137   70 22.0 28.8 0.14    1  17.3  15.6   100    59   2597  0.6
 16:41:00  137   66 23.0 27.9 0.14    1  15.6  14.2   100    61   2611  0.6
 16:40:00  136   63 25.0 27.8 0.15    1  16.0  14.7   100    59   2611  0.6
 16:39:00  136   64 23.0 28.2 0.13    1  14.6  13.2   100    60   2611  0.6
 16:38:00  136   62 21.0 27.8 0.14    1  16.1  14.7   100    61   2609  0.6
 16:37:00  136   67 20.0 28.1 0.13    1  15.0  13.6   100    60   2609  0.6
 16:36:00  136   65 21.0 27.5 0.15    1  63.4  62.0   100    61   2607  0.6
 16:35:00  136   63 22.0 27.5 0.15    1  15.4  14.0   100    60   2605  0.6
 16:34:00  136   64 20.0 27.9 0.12    1  16.1  14.7   100    61   2604  0.6
 16:33:00  136   64 20.0 28.4 0.15    1  14.9  13.5   100    60   2609  0.6


PF1=Help      PF2=Menu      PF3=Quit   PF4=Select  PF5=Plot    PF6=TOC     PA1=CP
PF7=Backward  PF8=Forward   PF9=Sort   PF10=Parms  PF11=More   PF12=Exit   PA2=Copy
 ====>
```

zMON 3270 TOC



zMON 3270 Zoom

```
Screen: ESAUSP2  Velocity Software - VSIVM4      ESAMON 4.090 01/18 17:09-17:10
1 of 3  User Percent Utilization                 CLASS *                2096 44B42

                                 <-------Main Storage-------->
          UserID    <Processor> <Resident->  Lock <-WSSize-->
Time      /Class    Total  Virt Total  Actv   -ed Total  Actv
--------  --------  ----- ----- ----- ----- ----- ----- -----
17:10:00  System:   15.32 14.23  667K  665K  5448  675K  665K
          REDHAT     4.58  4.53  281K  281K  1997  284K  284K
          TEST       3.56  2.98  161K  161K   844  161K  160K
          *TheUsrs   3.12  3.02 57661 57645   290 59127 57322
          SUSE       1.63  1.57  109K  109K   839  109K  108K
          ORACLE     0.96  0.96 50503 50503    66 50437 50437
          Velocity   0.93  0.90  4552  3444    28  7385  3401
          KeyUser    0.36  0.15  2973  2973  1379  1898  1573
          Servers    0.17  0.13   943   520     5  1874   495
```

Hit PF2 to zoom on SUSE class, get:

```
Screen: ESAUSP2  Velocity Software - VSIVM4      ESAMON 4.090 01/18 17:11-17:12
1 of 3  User Percent Utilization                 CLASS SUSE USER *      2096 44B42

                                 <-------Main Storage-------->
          UserID    <Processor> <Resident->  Lock <-WSSize-->
Time      /Class    Total  Virt Total  Actv   -ed Total  Actv
--------  --------  ----- ----- ----- ----- ----- ----- -----
17:12:00  SLES11X    0.39  0.39 24223 24223   247 23976 23976
          SLES11     0.32  0.32 12404 12404   181 12199 12199
          SUSELNX2   0.25  0.23  3648  3648     0  3628  3628
          SLES9X     0.21  0.21 14632 14632    35 14597 14597
          SLES10     0.20  0.20 28935 28935   299 28636 28636
          SLES9      0.20  0.20 12722 12722   177 12545 12545
          SLES8      0.06  0.03 11251 11251     0 11201 11201
          SLES8X        0     0     0     0     0   890     0
          SUSELNX1      0     0     0     0     0   219     0
```

zTUNE

- New installations lack z/VM and Linux on z/VM tuning skills
- Velocity Software's objective is to ensure our customer performance problems are resolved – quickly
- zTUNE includes configuration guidance, health checks whenever installation request, and assistance in all areas of Linux on z/VM and z/VM performance
- No more "performance was unexplainably bad so we abandoned the project"

Health Checker for z/VM, Linux: zTUNE

- Focus more now on simplifying problem resolution
- Customer reports that application people are complaining about zLinux and WAS performance

```
Report: ESATUNE      Tuning Recommendation Report
Monitor initialized:                    on 2084 serial 9ABED
------------------------------------------------------------
The following changes are suggestions by Velocity Software
 to enhance performance of this system.
However, Velocity Software takes no responsibility -
 all tuning is the responsibility of the installations.
Please call 650-964-8867 if you have any questions about
 these values, or suggestions on report enhancements.

USR2 User LINUX160 is paging excessively (75.0 per second)
     This user can be protected using SET RESERVED

SPL5 Spool utilization is 100% full.
     Perform Spool file analysis and purge large
     spool files, or force users currently writing
     excessively to spool.

*****zTUNE Evaluation   *************
XAC1 User total PROCESSOR WAIT excessive at 33 percent.
     Current reporting threshold set to 20.
     This is percent of inqueue time waiting for
     specific (PROCESSOR)resources to become available.
LPR3 LPAR share is too low, causing USER CPU Wait
     VM LPAR allocated share: 0.94 percent of total
     VM LPAR used 389 percent of allocated share
```

Operational Support

Alerts

- User tailorable
- 3270 based, web based, and/or SNMP
- Alerts can be set on any variable or calculated variable

- **Linux alert examples:**
  - Disk full
  - Missing processes (requires complete data)
  - **Looping processes (requires correct data)**
- **z/VM alert examples:**
  - Page/spool space full (avoid abends)
  - Looping servers
  - DASD service times
- **Network alert examples:**
  - Transport errors
  - ICMP rates
  - Bandwidth thresholds

VSE 4.3 adds SNMP Interface plus some mibs

IBMVSE “vse mib” – system data

```
Report: ESAVSES       VSE System Configuration Report
-------------------------------------------------------------
NODE      <---z/VM---> <LogicalPart> <--------CPU model-------
/Time     VirtID   Lvl  Name      Nbr <IBM/<model>/CPs/ serial
--------  -------- ---  --------  --- -------------------------
06:26:00
vse2      ZVSE       1  VSIVM3      0  IBM 2096-A02 02 (14B4202)
-------------------------------------------------------------
06:27:00
vse2      ZVSE       1  VSIVM3      0  IBM 2096-A02 02 (14B4202)


-------------------------------------------------------------
NODE      <---z/VM---> <--Partitions--> <----CPU Counts---->
/Time     VirtID   Lvl Max Cur Stat Dyn Tot Actv Quies Inact
--------  -------- --- --- --- ---- --- --- ---- ----- -----
06:26:00
vse2      ZVSE       1  120  20   12   8   2    2     0     0
-------------------------------------------------------------
06:27:00
vse2      ZVSE       1  120  20   12   8   2    2     0     0
```

VSE Support

VSE 4.3 adds SNMP Interface plus some mibs:

IBMVSE “vse mib” adds CPU data for system, and by virtual CPU

```
Report: ESAVSEC      VSE System Performance Report                  VSIVM3
-------------------------------------------------------------------------
NODE       Pages/Sec <Rate/Sec> <CPU Utilization>   All       Pct  Seconds
/Time      In   Out   SVC  DSP  Total  Mstr  Spin   Bound      NP  OfData
--------   ---- ---- ---- ----  -----  ----- -----   -----    ----  ------
06:26:00
vse2          0    0  196  428   83.6   4.0   0.0       0     4.8    64.6
 CPU- 0                 270   40.5   2.7     0       0     6.6    64.6
 CPU- 1                 160   43.7   1.4   0.0       0     3.2    64.6
-------------------------------------------------------------------------
06:27:00
vse2          0    0  295  597   82.5   4.2   0.0       0     5.1    56.0
 CPU- 0                 359   36.6   3.2   0.0       0     8.8    56.0
 CPU- 1                 238   45.3   1.0     0       0     2.2    56.0
```

VSE Support

Velocity Software proof of concept for "Plug in"

- SNMP Support is "extensible"

What do customers want?

- TCPIP?
- VSAM?
- CICS?
- DB2
- High Capture ratio?

```
Report: ESAVSEP      VSE Partition Performance
-----------------------------------------------
NODE       Part   Job       Phase     <-CPU Time->
/Time      ID     Name      Name      CPU   Overhd
--------   ----   -------- --------   ----- ------
06:26:00
vse2            Totals                52.0   1.5
           FB   SECSERV   BSTPSTS       0     0
           F7   TCPIP00   IPNET       0.3   0.0
           F6   TCPIP01   IPNET       0.0   0.0
           F3   VTAMSTRT  ISTINCVT    0.0   0.0
           F2   CICSICCF  DFHSIP      0.6   0.0
           F1   POWSTART  IPWPOWER    0.0   0.0
           R2   STARTMAS  IESMASNM    0.6   0.0
           R3   STRTMAS1  IESMASNM      0     0
           S1   STGPLAY5  STGPLAY     6.6   0.4
           S2   STGPLAY2  STGPLAY     0.6   0.1
           S3   STGPLAY4  STGPLAY    11.6   0.3
           S4   STGPLAY1  STGPLAY    17.3   0.3
           R1   STARTVCS  IESVCSRV    0.0   0.0
           S5   STGPLAY3  STGPLAY    14.3   0.3
```

zVPS Measurement Summary

- **zVPS Meets Performance Management Requirements:**
  - Sufficient for performance, capacity planning, accounting, Operations
  - Linux and z/VM data – Integrated
  - Complete and correct data
- **zVPS Meets Infrastructural requirements**
  - Support all releases (SLES, RHEL, UBUNTU, z/VM)
  - Standard interfaces (Monitor, snmp)
  - Low resource requirements
- **zTUNE (Health Check for z/VM, Linux)**
  - **zTUNE - http://velocitysoftware.com/products.html**
- **zPRO – Cloud Enablement AND Management**
- **zVRM**
- **Performance Education:**
  - Performance education, see: **"http://velocitysoftware.com/workshop.html"**