The zEnterprise:  
A Better Business Strategy

Paul R. Robichaux  
NewEra Software, Inc.

MVS Project Keynote Address  
Monday, February 4th at 9:30 – 10:30 am  
Session Number - 12249  
Location – Imperial A
Abstract and Speaker

• One of the primary missions of those charged with the responsibility to enhance and sustain the operational availability and integrity of the zEnterprise is to maintain their currency in both overall IT Server Market Trends and changes that specifically impact the z/OS Environment. Such individual currency helps organizations to adapt their IT Strategies to best fit the need of business users and aids them in their long term effort towards reducing the Total Cost of z/Enterprise Ownership (TCO).

• This presentation will provide insight into:

  First, the High-End Server Market and its shift to “Hyper-Scale” class and the recognition currently being given to the likely long-term market share leader: is it IBM, HP, Dell, Oracle or another?

  Second, the High-End Server attributes that will determine the success or failure of the market leader over time as needs shift from Hardware to Management Concerns: Tools, Space and Power.

  Third, recent enhancements to old and/or the introductions of new z/OS Management Tools: zAware, The IBM Health Checker for z/OS, The Unified Resource Manager, z/OS System Management Facility, AUTORxx – A Parmlib Member, Runtime Diagnostics (RTD) and The Policy Management Agent (PAGENT).

• Paul R. Robichaux is CEO and co-founder of NewEra Software, Inc. He served as the Chief Financial Officer of Boole and Babbage for the ten years immediately preceding his co-founding of NewEra in 1990. He holds a BS in Accounting and a Masters in Business Administration from a Louisiana State University and is a Certified Public Accountant.

• The corporate mission of NewEra Software is to provide software solutions that help users avoid non-compliance, make corrections when needed and in doing so, continuously improve z/OS integrity.
Hello my name is Paul.

I’m a “Mainframer”

and

very proud of it!
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*zEnterprise Management - Some Things Old are New Again!*

“IBM and the Seven Dwarfs”

1 http://www.dvorak.org/blog/ibm-and-the-seven-dwarfs-dwarf-one-burroughs/
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*zEnterprise Management - The New Normal!*

"IBM and the Three Bears"

1 http://www.imadethatup.com/
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*zEnterprise Management – In this Presentation you will find!*

- **A Business Point of View**
  - The Battle for the Server Market
  - Some Things Old are New Again!
  - Market Share Drivers, Response
  - How are the Players Doing?
  - Who is Best Positioned to Prevail?

- **The Next Generation System Management Tools**
  - zAware
  - IBM Health Checker for z/OS (HZS)
  - The zManager (Formally URM)
  - Runtime Diagnostics (RTD)
  - z/OS Management Facility (z/OSMF)
  - AUTORxx - a ParmLib Member
  - The Policy Management Agent (PAGENT)
Hyper-scale servers are designed for large scale datacenter environments where parallelized workloads are prevalent. The form-factor serves the unique needs of these datacenters with streamlined system designs that focus on:

- Performance
- Energy efficiency
- Platform Density

Hyper-scale servers forego the full management features and redundant hardware components found in traditional enterprise servers as these capabilities are accomplished primarily through software.

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1 Source: Starting Q3 2011, IDC began to track the new form-factor called hyper-scale/Hybrid servers.
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*zEnterprise Management – Little to Big Vs. Big to Little!

Doing the Math!

- Over Last 20 Years:
  
  \[
  \frac{78,426}{66} = 1,188.34
  \]

- Over Last 10 Years:
  
  \[
  \frac{78,426}{9,060} = 8.65
  \]

- Over Next 10 Years:
  
  \[
  \frac{150,000}{78,426} = 1.91
  \]

1 Source: http://www.tech-news.com/publib/pl9672g, pl2084, pl2094, pl2097, pl2817 and pl2827 all .html
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zEnterprise Management – Hasn’t it always been about “Reads and Feeds”?

Relative MIP Cost

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<td>2094-754</td>
<td>2097-764</td>
<td>2817-780</td>
<td>2827-7A1</td>
<td>2837-xx</td>
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<td></td>
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<td>17,802</td>
<td>29,590</td>
<td>52,286</td>
<td>78,426</td>
<td>xx,000</td>
</tr>
</tbody>
</table>

100% 70% 43% 33% 30%

The Wall

Next Two/Three Years?

Six ½ Years

Source: http://www.tech-news.com/publib/pl2084, pl2094, pl2097, pl2817 and pl2827 all .html
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*zEnterprise Management - zEC12 and V2R1 - It can be complicated!*

<table>
<thead>
<tr>
<th>ZCPU</th>
<th>LCSS</th>
<th>LPAR</th>
<th>CHPID</th>
<th>SSET</th>
<th>UNIT</th>
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<tr>
<td>HCD/HCM</td>
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<tr>
<td>IDName (IOCP)</td>
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<td>1</td>
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<tr>
<td>SwitchID (SWCP)</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td></td>
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<tr>
<td>ConfigID (OSCP)</td>
<td>2</td>
<td>3</td>
<td></td>
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<tr>
<td>Parmlib</td>
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<tr>
<td>TSO/ISPF</td>
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</table>

Complete your sessions evaluation online at SHARE.org/SanFranciscoEval
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*zEnterprise Management - Economic Drivers – Total Cost of Ownership (TCO)*

1. **Server Hardware**: 60%
2. **Server Management**: 30%
3. **Other Operating Costs**: 0%
4. **Percentage of TCO**
   - 0% in 1996 for 1996
   - 60% in 2013 for Server Hardware
   - 20% in 2013 for Other Operating Costs
   - 70% in 2013 for Other Operating Costs

**Critical Success Factors**
- **Tools**
- **Space**
- **Power**

**1 Source: Dr. John Shedletsky – IBM Technical World – San Francisco – April, 2012**
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*zEnterprise Management - Tools help us make sense of it all, right?*

Are you ready to trust Autonomous Systems?
"ones who gives themselves their own laws"

1 More than 40,000 unique message IDs are defined for z/OS and the IBM software that runs on z/OS systems.
In a College Dictionary (Abridged) there are 50,000 - 70,000 words
On October 4, 2006 IBM announced, in a press release, a $100 Million System z Platform Simplification Initiative. This announcement, in part the z/OS V1R8 introduction, foretold the coming of the Next Generation of z/OS Management tools.

These Next Generation Tools appear to have the following positive attributes:

- Low or No Cost Entry Points
- Predictive Analytics
- Making Sense out of z/OS Events

Many of these rolled out as incremental enhancements to the Base Control Program.

1 Source: NewEra White Paper - A Brief Look at What’s New in V1R12 and/or V1R13 – 9/01/2011
# A Better Business Strategy

**zEnterprise Management - Economic Performance – Key Players**

<table>
<thead>
<tr>
<th>HP (30)</th>
<th>Dell (15)</th>
<th>Oracle (6)</th>
<th>IBM (30)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Down 10% in 2011 and 23% in most recent quarter. Lenovo a Threat?</td>
<td>Still growing but pace has slowed. Large enterprise revenues up 5%.</td>
<td>Shrinking, plan to give up on unprofitable businesses.</td>
<td>High-end leader, business very profitable. Growth is modest.</td>
</tr>
<tr>
<td>2 Disclosure of apparent accounting fraud latest humiliation of tech giant.</td>
<td>PC eroding, enterprise division not enough to support company, use cash to acquire growth.</td>
<td>Better-than-expected software sales help tech giant beat expectations</td>
<td>Risk to exceeding 2015 projections: global slowdown, delayed or cancelled projects.</td>
</tr>
</tbody>
</table>

**Global Market Factors:**
- ✔ Slowing Growth - CEO Uncertainty
- ✔ Falling Margins – Hardware Price Increase
- ✔ Share gains for low-cost providers
- ✔ Questionable Macroeconomic Trends

**Strategies:**
- ✔ HP - Cleanup the Acquisition Mess
- ✔ Dell - Work with Hedge Funds, go Private
- ✔ Oracle - Acquire SaaS Clouds - Eloqua
- ✔ IBM - Stay the Course, Invest in Tools

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1. SHARE 08/12 - Financial Times – Friday, June 1, 2012 and (xx)Percentage Market Share – Q3 2011 - IDC
2. SHARE 02/13 – SJMN 12/19/2012 and Business Insider 11/2012 and http://seekingalpha.com/article/302020 & 821141
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*zEnterprise Management – Relative Stock Market Performance - Last Six Months*  

![Graph showing relative stock market performance of IBM, HPQ, ORCL, DELL from June 2012 to December 2012.](image)

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*zEnterprise Management – Relative Stock Market Performance - Last Nine Months*

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*zEnterprise Management* - *Economic Performance* – *Key Players* - *The HP Story*

Hewlett-Packard (NYSE: HPQ)

- The “value” story
  - Forward P/E of 5.2x, forward EV/EBIT of 5.6x
  - FCF yield of 10.7% using LTM FCF before share-buybacks and acquisitions
  - $6.3B in share-buybacks and dividends in LTM, equal to 162% of FCF
- Growth through acquisitions has not paid off
  - $36.9B spent on acquisitions since 2007, equal to 82% of FCF
  - Despite acquisitions, LTM cash-flow from operations is 7% less than it was in 2007
  - Total debt at 1Q12 was $30B, up 70% from 1Q10
  - Acquisitions track record: Compaq impairment, EDS restructurings, Palm write-off, Autonomy revenue implosion
- HPQ’s businesses are struggling
  - PCs: LTM operating income down 5% YoY; cannibalization from mobile computing
  - Printers: LTM operating income down 28% YoY; fall in inkjet printing
  - IT services: LTM operating income down 23% YoY; lack of Itanium support from Oracle, falling government spending, competitive pressures
  - Servers/networking: LTM operating income down 19% YoY; fall in UNIX market
- Lack of strategy, as evidenced by 3 CEOs since 2006

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*zEnterprise Management – Relative Stock Market Performance - Last Month*

- VMware
- Apple
- IBM
- BMC
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*zEnterprise Management – Heads in the Clouds – Hyper-Scale Challengers* 1

**Market Capitalization: Common Share Price X Common Shares Outstanding**

1 [www.nasdaq.com - Financial Results – APPL, XOM, MSFT, IBM, GOOG, ORCL, JPM, AMZN, CSCO, Citi, EMC, GS, HP, DELL, CRM, FB, VMW](#)
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zEnterprise Management - Economic Performance – Key Players - The IBM Story

Key Drivers for 2015 EPS Road Map

Revenue Growth
A combination of base revenue growth, a shift to higher margin businesses and strategic acquisitions.

Operating Leverage
A shift to higher margin businesses and enterprise productivity derived from global integration and process efficiencies.

Share Repurchase
Leveraging our strong cash position to return value to shareholders by reducing shares outstanding.

At Least $20 Operating EPS

IBM Health Checks for z/OS – The Check Inventory

IBM Health Checks for z/OS – HZS Overview

RACF Checks:
- RACF_SENSITIVE_RESOURCES
- RACF_IBMUSER_REVOKEY
- RACF_OPERCMDS_ACTIVE
- RACF_FACILITY_ACTIVE
- RACF_TAPEVOL_ACTIVE
- RACF_TEMPDSN_ACTIVE
- RACF_TSOAUTH_ACTIVE
- RACF_UNIXPRIV_ACTIVE
- RACF_GRS_RNL_ACTIVE
- RACF_ICHAUTAB_NONLPA
- RACF_AIM_STAGE
- RACF_UNIX_ID
- MY_INSTALLATION_HEALTH_CHECK

1 IBM Health Checker for z/OS V1R13 User's Guide - SA22-7994-12
2 Mark Nelson, z/OS Security Server (RACF) Design and Development - APAR OA37164
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*zEnterprise Management – Checks Vs. Predictive Failure Analysis*¹ (PFA)!

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RTD provides an extended diagnostic mechanism that results in the convergence of the functional processes and source information provided by:

- Operator commands
- System log
- Message searches
- Address space and Task analyses

RTD produces console and system log messages which can alert supporting personnel, and drive manual and/or automated responses when RTD detects a z/OS system troubled by “Soft Failures”.

1 Source: z/OS V1R13.0 Problem Management V1R13 - G325-2564-08 - Part 2 Ch 4
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zEnterprise Management - RTD\(^1\) – Getting on Board – Predictive Failure Analysis

Display Command Output:

```
F HZR,ANALYZE
HZR02001 RUNTIME DIAGNOSTICS RESULT 692
SUMMARY: SUCCESS
REG: 002 TARGET SYSTEM: SY1 HOME: SY1 2010/12/21 - 14:32:01
INTERVAL: 60 MINUTES
EVENTS:
FOUND: 02 - PRIORITIES: HIGH:02 MED:00 LOW:00
TYPES: LATCH:02
EVENT 01: HIGH - LATCH - SYSTEM: SY1 2010/12/21 - 14:32:01
LATCH SET NAME: SYSTEST.LATCH_TESTSET
LATCH NUMBER:0039 JOBNAME:TSTLATCH
TOP WAITER - ASID:0039 JOBNAME:TSTLATCH - TCB/WEB:004E2A70
TOP BLOCKER - ASID:0039 JOBNAME:TSTLATCH - TCB/WEB:004FF028
ERROR: ADDRESS SPACES MIGHT BE IN LATCH CONTENTION.
ACTION: D CRN,AN,LATCH,DEP,CASID=0039,LAT=(SYSTEST.L*,3),DET
ACTION: TO ANALYZE THE LATCH DEPENDENCIES. USE YOUR SOFTWARE
ACTION: MONITORS TO INVESTIGATE BLOCKING JOBS AND ASIDS.
```

\(^1\) Source: z/U 04/2012 - zZS40: z/OS Problem Determination new technologies by Anuja Deedwaniya
The zAware LPAR (created from the HMC and acting somewhat like a CF LPAR) is used by IBM zAware as an operational vantage point from which it creates a model of normal sysplex-wide system behavior based on prior system data, and uses pattern recognition techniques to identify and report unexpected system messages or unexpected behavior in current data.
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**zEnterprise Management - zAware – Getting on Board – Using System Logger**

- **System Logger**
  - PARMLIB Updates:
    - IEASYSxx – IXGCNF=xx
    - IXGCNFxx
    - COUPLExx
    - CONSOLxx

- **Native z/OS Message Issuers**

- **Log Streams**

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1 z/U 04/2012 - zZS18: Smart Monitoring of z/OS with IBM zAware on zEC12 by Riaz Ahmad
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13108: Introduction to the Linux Health Checker
   Monday, February 4 - 3:00PM
   Franciscan C Ballroom Level
   Speaker: Stefan Raspl, IBM Germany

12744: Configuring Health Checker for z/OS – Hands-on Lab
   Tuesday, February 5 - 11:00 AM
   Union Square 23-24
   Speaker: Gordon Daniel, NewEra Software, Inc.

13118: Intro and Getting Started with the IBM Health Checker for z/OS
   Tuesday, February 5 - 4:00PM
   Franciscan C Ballroom Level
   Speaker: Marna Walle, IBM Corporation

13084: PFA (Predictive Failure Analysis) and Runtime Diagnostics
   Thursday, February 7, 2013: 11:00 AM-12:15 PM
   Franciscan B, Ballroom Level (San Francisco Hilton)
   Speaker: Karla Arndt (IBM Corporation)
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*zEnterprise Management - zAware - Getting on Board - SHARE SF Sessions*

- **12917: Experiences with IBM zEC12 Flash Express and IBM zAware Features**
  *Wednesday, February 6, 2013: 8:00 AM-9:00 AM*
  *Yosemite C, Ballroom Level (San Francisco Hilton)*
  *Speaker: Mary Astley (IBM Corporation)*

- **13063: IBM zAware - Using Analytics to Improve System z Availability**
  *Wednesday, February 6, 2013: 9:30 AM-10:30 AM*
  *Imperial A, Ballroom Level (San Francisco Hilton)*
  *Speaker: Garth Godfrey (IBM Corporation)*

- **13066: Setting up IBM zAware - Step by Step**
  *Wednesday, February 6, 2013: 11:00 AM-12:15 PM*
  *Imperial A, Ballroom Level (San Francisco Hilton)*
  *Speakers: Garth Godfrey (IBM) and Thomas B. Mathias (IBM)*

- **12791: Improve Service Levels with Enhanced Data Analysis**
  *Thursday, February 7, 2013: 9:30 AM-10:30 AM*
  *Golden Gate 6, Lobby Level (San Francisco Hilton)*
  *Speaker: Paul Smith (IBM Corporation)*
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**zEnterprise Management - zAware Vs. HZS, PFA and RTD¹ - Is it a Smack-Down?**

<table>
<thead>
<tr>
<th>Solutions Available:</th>
<th>Rules based</th>
<th>Analytics / Statistical model</th>
<th>Examines message traffic</th>
<th>Self Learning</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>- z/OS Health Checker</td>
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<td>Rules based to screen for conditions</td>
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<tr>
<td>▪ Checks configurations</td>
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<tr>
<td>▪ Programmatic, applies to IBM and ISV tools</td>
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<tr>
<td>▪ Can escalate notifications</td>
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<td>- z/OS PFA</td>
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<td>Early detection</td>
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<td>▪ Trending analysis of z/OS system resources, and performance</td>
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<tr>
<td>▪ Can invoke z/OS RTD</td>
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<tr>
<td>- z/OS RTD</td>
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<td></td>
<td>After an incident</td>
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<tr>
<td>▪ Real time diagnostics of specific z/OS system issues</td>
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<tr>
<td>IBM zAware</td>
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<td></td>
<td></td>
<td>Diagnosis Useful before or after an incident</td>
</tr>
<tr>
<td>▪ Pattern based message analysis</td>
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<tr>
<td>▪ Self learning</td>
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<tr>
<td>▪ Provides aid in diagnosing complex z/OS problems, including cross sysplex, problems that may or may not bring the system down</td>
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</tbody>
</table>

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¹ z/U 04/2012 - zZS18: Smart Monitoring of z/OS with IBM zAware on zEC12 by Riaz Ahmad
The integration of a hardware platform that brings mainframe and distributed technologies together will, over time, replace individual islands of computing. These integrated resources are called Ensembles.

Each Ensemble will be managed as a single, logical “Virtualized” system by the URM, through the HMC. The HMC will create and manage ensemble resources.

Some of the benefits of the ensemble:
- Reduction of complexity
- Improved security
- Applications closer to needed data.

Source: zEnterprise Unified Resource Manager: Building an Ensemble, SG24-7921-00
The zEnterprise Ensemble is a highly virtualized heterogeneous system that can be managed as a single logical entity and where heterogeneous workloads can be deployed. Some characteristics of an ensemble are:

- A CPC, with/without zBX, is called a node.
- An ensemble can contain one to eight nodes.
- A node can be in only one ensemble.
- Dedicated net for management and data.

An ensemble is managed as a single system by the Hardware Management Console (HMC). The HMC is used to create/manage ensemble resources.

Source: zEnterprise Unified Resource Manager: Building an Ensemble, SG24-7921-00

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zEnterprise Management - “zManager” - Creating/Managing Virtual Workloads

1 Source: zEnterprise Unified Resource Manager: Building an Ensemble, SG24-7921-00
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*zEnterprise Management* - HMC - Getting on Board - SHARE SF Sessions

- 12808: IBM System z Hardware Management Console (HMC) 2.12.0  
  **Monday, February 4, 2013: 4:30 PM-5:30 PM**  
  Franciscan B, Ballroom Level (San Francisco Hilton)  
  Speaker: **Brian Valentine (IBM Corporation)**

- 12255: The HMC is a Fantastic Feature of the zEnterprise but What Mistakes Are You Making Securing It?  
  **Tuesday, February 5 - 12:15 PM**  
  Plaza B - Speakers: **Schrager and Robichaux**

- 12807: HMC Security Basics and Best Practices  
  **Tuesday, February 5 - 3:00 PM**  
  Franciscan D  
  Speaker: **Brian Valentine (IBM Corporation)**
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*zEnterprise Management - z/OSMF - The z/OS Easy Button*¹

- The many z/OS interfaces (including HCM) that are available are foreign to users new to the platform. In most cases, manual tasks require extensive documentation and require years of z/OS experience to be productive.

- z/OSMF is a WEB 2.0 based application on z/OS with direct access to z/OS data and information, and a secure browser interface from the workstation.

- z/OSMF contains the GUIs and the application code. Everything is installed on the z/OS server. There are no client-side install requirements.

¹ Source: z/OS Management Facility, SG24-7851-00
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*zEnterprise Management - z/OSMF - The z/OS Easy Button*¹

- z/OSMF provides support for a modern, Web browser-based z/OS management console.

- z/OSMF helps system programmers to more easily manage a mainframe system by simplifying day to day operations and administration of a z/OS system.

- z/OSMF provides the intelligence needed to address the requirements of a diversified workforce, maximizing their productivity.
  
  ✓ Automation reduces the learning curve and improves productivity.
  
  ✓ Embedded assistance guides activities and simplifies operations.

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¹ *Source: SHARE Seattle, Session 2249 – Greg Daynes & Anuja Deedwaniya*
In V1R13 a new parmlib member was added to define auto-reply policies. It can contain comments that provide message text for each WTO and related rules.

Use AUTORxx to activate auto-reply processing. The default member AUTOR00 contains the policies suggested by IBM. You can modify AUTOR00 (Not Recommended), or define another to customize your policies.

```
notifymsgs(hc)
/****************************************************************************
/* $HASP811 REPLY Y CONTINUE N TO TERMINATE PROCESSING */
Msgid(?HASP811) Delay(30S) Reply(Y)
/****************************************************************************
/* ANTU2220D FLASHCOPY. I TO INITIATE, C TO CANCEL */
Msgid(ANTU2220D) Delay(60S) Reply(C)
```
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*zEnterprise Management - The AUTORxx – New z/OS V1R13*¹

- **[NOTIFYMSGS ({HC | CONSOLE})]**
  - HC - indicates that the auto-reply notification messages only appear in the hardcopy log.
  - CONSOLE - Indicates that the auto-reply notification messages are displayed on consoles receiving operator or system programmer information.

- **Auto-Reply Processing Possibilities:**
  - Rule-1: Problem
  - Rule-2: Recovery Issues
  - Rule-3: Dynamic Change
  - Rule-4: Confirmation
  - Rule-5: Continue IPL
  - Rule-6: Recommended Value

---

¹ *Source: MVS Initialization and Tuning Reference - SA22-7592-23 – See AUTORxx*
Identifying that scanning missions are underway can alert the security analyst as to what services or types of computers are being targeted for possible attack.

Knowing what services are targeted allows an administrator to take preventative IPSec measures, e.g. installing patches, fire walling services from the outside, or removing services on machines which do not need to be running on them.

Port Scan detection counts distinct destination IPs attempting to connect to a given Port within a certain time window.

---

1 Source: Scan Detection By György J. Simon, Hui Xiong University of Minnesota, Rutgers University
The Policy Agent, a z/OS address space, provides the policy infrastructure needed by the 
z/OS Communications Server. PAGENT can act in the following roles:

- Policy Server executes on a single system and installs policies of others
- Policy Client, retrieves remote policies from the Policy Server.

Infrastructure Components:

- TRMD: Traffic Regulation Management
- IKED: Internet Key Exchange
- NSSD: Network Security Services
- DMD: Defense Manager
- nslapm2: a subagent used for reporting

---

1 Source: Source: IBM z/OS V1R13 CS TCP/IP Implementation – 3/2012 Volume 4 - Security and Policy-Based Networking
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*zEnterprise Management – You can, You will make the difference!*

1 “There and Back Again” by Bilbo Baggins a Distinguished Hobbit
That's it folks, all done!

The zEnterprise: a Better Business Strategy

Paul R. Robichaux
NewEra Software, Inc.
prr@newera.com

www.SHARE.org/SFEvaluation