Right sizing Linux on IBM z Systems and LinuxONE
Created for the VM Workshop

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How many analogies have you heard?

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IBM: Stolen Servers

Fit for Purpose

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Manually Right Sizing/Tuning Linux on IBM z

- **So much more than just adjusting to its Working Set Size (WSS).**
- **So much more than just changing SHARE settings.**
- **Lots of tuning guides, documentation and products exist:**
    - **Redbooks on the topics**
    - **IBM z/VM manuals**
    - **IBM z/VM Labs Performance Resources**
    - **Linux on z/VM Hints and Tips**
    - **Velocity Software's Frequently Asked Performance Questions**
    - **IBM z/VM's Performance Toolkit**
    - **Velocity Software's Products for Performance and Capacity Planning**

IBM's Virtual Machine Resource Manager (VMRM)

```
/* ADMIN STATEMENT */
/* This will cause messages to be sent to VMRMADMN's console */
ADMIN MSGUSER vmrmadmn

/* GOAL STATEMENTS */
GOAL MAX VELOCITY CPU 100 DASD 100
GOAL MIDDASD VELOCITY DASD 50
GOAL MINCPU VELOCITY CPU 1

/* WORKLOAD statements followed by corresponding MANAGE statement */
* workload 1
WORKLOAD WORK1 USER linux* manfred fredrick usera,
     userb chris kurt doug jon
MANAGE WORK1 GOAL MAX IMPORTANCE 5
```

CMM and SHARE Settings

Chapter 17. VMRM Tuning Parameters

And it created a death spiral

Automate Right Sizing with zVRM

- **Velocity Software's new Resource Manager (zVRM) allows Linux virtual machines running with z/VM to be defined, like they are expected to run and grow in an x86 environment.**
- **Memory and virtual CPU's (with SHARE settings) are adjusted up and down using Knowledge-based Intelligence (KI) to the workload's requirement based on your predefined specifications.**
- **Now, the resources really required to run your workloads, compared to how they have been defined can be understood.**
- **Reduced resources for your workloads allows you to run more with less. Less resources equals quantifiable savings.**
- **Death spirals are prevented by creating a low-level threshold for resource defined to each guest being managed.**

zVRM test system - Real storage being returned
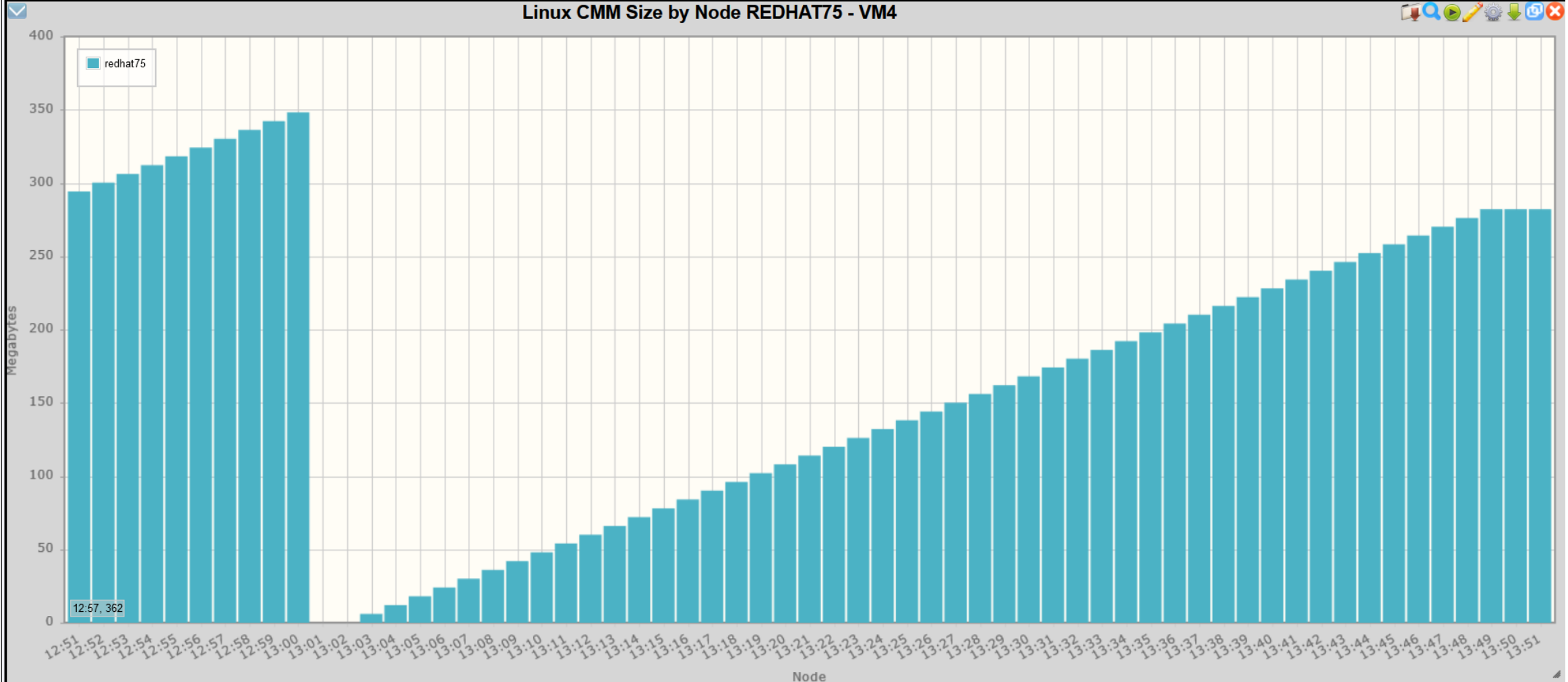
zVRM test system – vCPU added/removed

ESAUCD4 - LINUX UCD System Statistics Report - VM4

		<Processor Pct Util>				Idle	VCPU	<-Swaps->		<-Disk IO->		Switch	Intrpt	<-Load Averages->			<-CPU	Overhead%->		%IO-	Pro-
Time	Node/ Group	Total	Syst	User	Nice	Pct	Cnt	In	Out	In	Out	Rate	Rate	1Min	5Min	15Min	Krnl	IRQ	Inrpt	wait	rate
13:06:00	redhat75	0.1	0.1	0.0	0	100	1	0	0	0	0	20.9	12.5	0.02	0.42	0.29	0	0	0.02	0	0.90
13:05:00	redhat75	0.1	0.1	0.0	0	99.6	1	3.3	0	35.5	0	24.9	14.5	0.06	0.51	0.31	0	0	0	0	0.98
13:04:00	redhat75	0.1	0.1	0.0	0	99.9	1	0.5	0	4.0	0	20.0	12.3	0.16	0.63	0.34	0	0	0	0	0.84
13:03:00	redhat75	0.1	0.1	0.1	0	131	1	0.1	0	0.4	3.2	27.2	18.4	0.45	0.78	0.36	0	0.01	0	0	0.77
13:02:00	redhat75	0.1	0.1	0.0	0	196	2	17.6	0	693.1	13.9	55.8	46.5	1.24	0.95	0.39	0	0	0.02	0.02	1.18
13:01:00	redhat75	125.6	42.9	82.7	0	0.1	2	23K	22K	203K	179K	6059.0	3215.0	3.37	1.17	0.42	0	1.20	0.08	0.15	0.79
13:00:00	redhat75	67.8	21.7	46.1	0	52.0	1	35K	36K	310K	287K	9129.7	4606.2	2.09	0	0.17	0	3.35	0.15	0.17	1.50
12:59:00	redhat75	0.1	0.1	0.0	0	99.8	1	0	0	0	0	19.9	12.6	0	0	0	0	0	0.02	0	0.99
12:58:00	redhat75	0.1	0.1	0.0	0	99.8	1	0.1	0	1.9	0	19.6	12.3	0	0	0	0	0	0	0	0.67
12:57:00	redhat75	0.1	0.1	0.0	0	99.9	1	0.0	0	0.3	2.5	22.4	13.3	0	0	0	0	0	0	0	0.97
12:56:00	redhat75	0.1	0.1	0.0	0	99.8	1	0	0	0	0	21.0	12.5	0	0	0	0	0.02	0	0	1.11

Questions and Conversations
And thanks to the VM Workshop

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zVPS
PERFORMANCE SUITE

THE WORLD'S LEADING PERFORMANCE MANAGEMENT SOLUTION FOR Z/VM WITH LINUX AND/OR VSE. NEWLY ADDED SUPPORT FOR Z/OS PLUS NO-CHARGE MONITORING FOR X86 LINUX AND WINDOWS.

zPRO
CLOUD MANAGEMENT

SOLUTION FOR MODERNIZING THE Z/VM PLATFORM, ADDING ON-PREM CLOUD SUPPORT WITH WEB-BASED CONTROLS FOR Z/VM SYSTEM MANAGE-MENT PLUS LPAR CLONING AND ANSIBLE PLAYBOOKS USING VELOCITY'S HIGHLY AVAILABLE SMAPI-FREE API'S.

zLOV
LINUX ON VELOCITY

zTUNE
SUPPORT SUBSCRIPTION

VELOCITY SOFTWARE'S ELITE PER-FORMANCE SUPPORT SERVICE THAT CREATES AUTOMATED DAILY REPORTS WITH RECOMMENDED ACTIONS

zVRM
RESOURCE MANAGER

REAL-TIME MANAGEMENT FACILITY FOR Z/VM WITH LINUX THAT AUTO-MATES SYSTEM SETTINGS USING KNOWLEDGE-BASED INTELLIGENCE TO TUNE WORKLOAD REQUIREMENTS AND OPTIMIZE OVERALL SYSTEM PERFORMANCE.

VELOCITY SOFTWARE