Velocity Software

Implementing and Managing Cloud on z/VM

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Agenda

Velocity Software - Positioning

zPRO Version 1 Lessons

zPRO Version 2 Objectives

Management Requirements

- zVPS Introduction
- Operations Support

zPRO Installation in 10 minutes or less

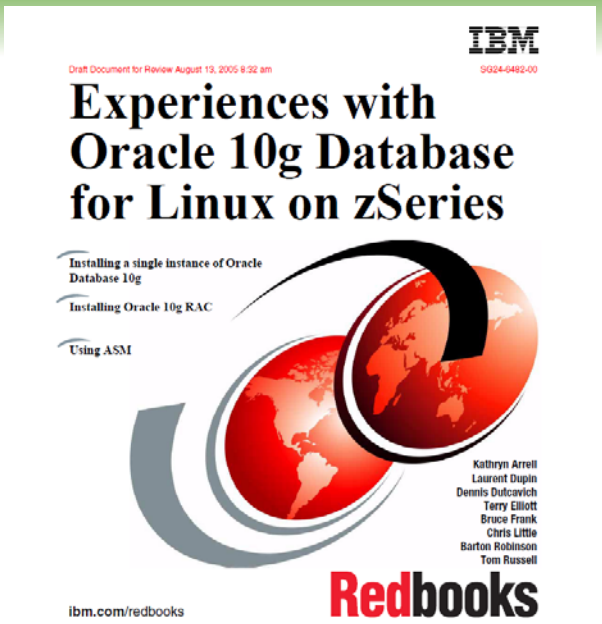
zPRO Demonstration

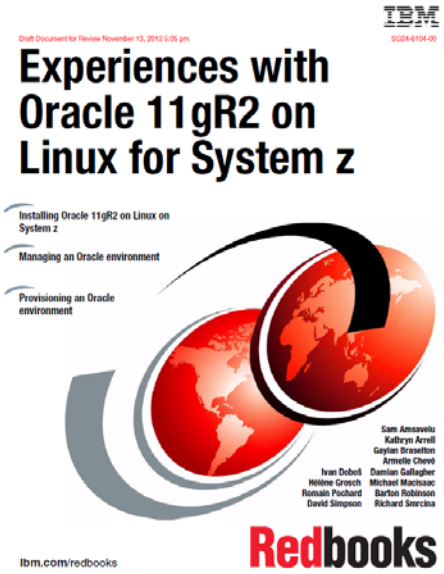
Velocity Software, Inc

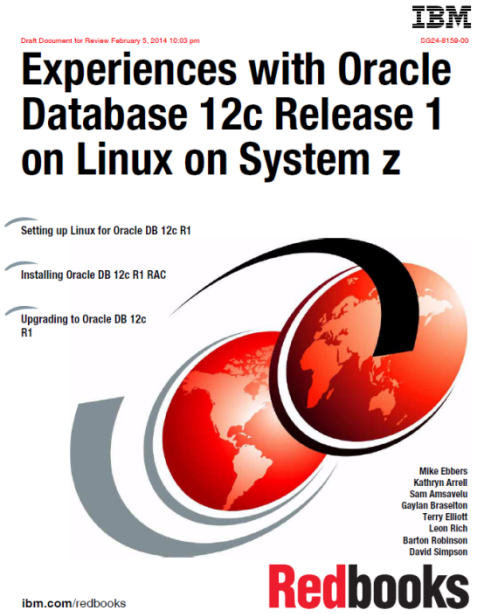
- **Founded in 1988**
  - Original Focus on VM/XA Performance Analysis
- **Current Focus**
  - z/VM and Linux on System z Performance Management
  - Network Performance Management
  - Application Performance Management (Oracle, JVM)
  - Operational Support (Alerts, Operations Console)
  - Distributed servers

  - Enabling z/VM for web based systems management
  - Self Service

Velocity Software, World Wide Involvement







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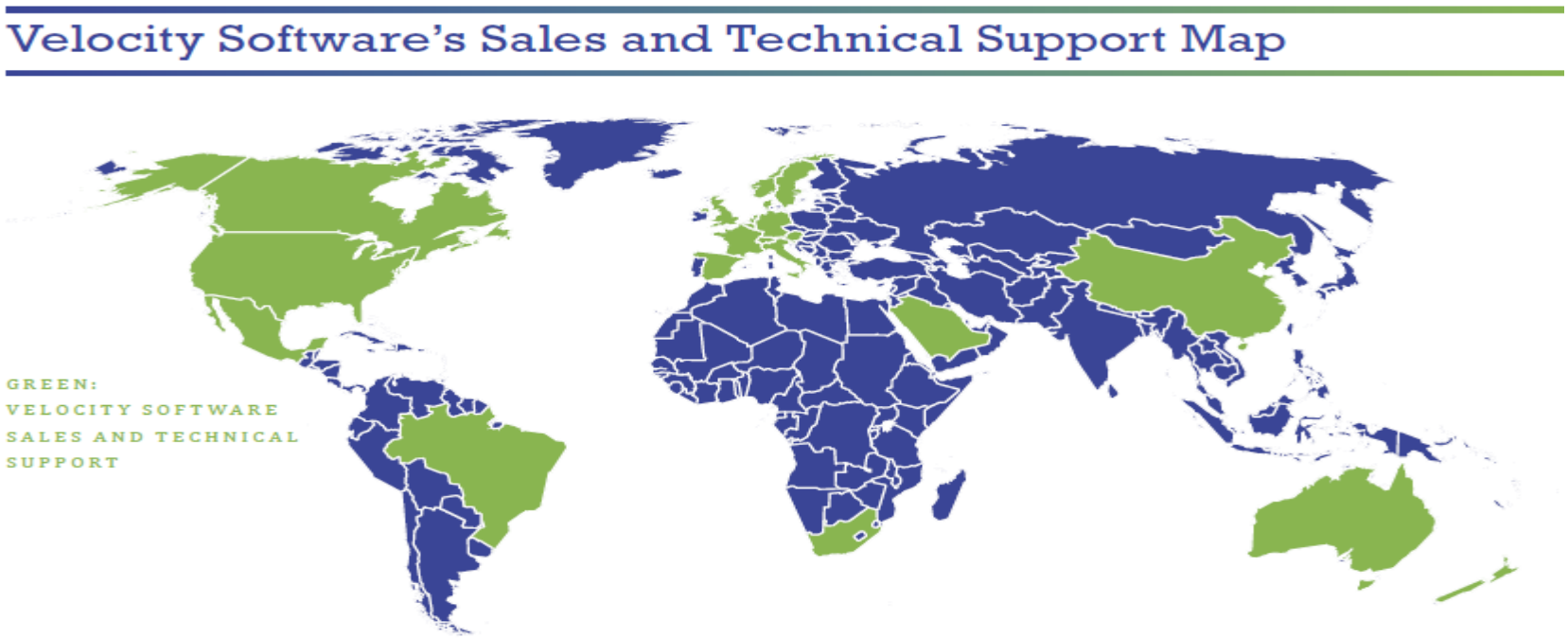
User group focus, presenting frequently:

SHARE, WAVV, VMWorkshop, CMG GSE UK, GSE Germany, UKzLUG, Italian, JoziLinux, Cavmen, Hillgang, MVMUA, MVMRUG, IBM Technical Universities,….

- **z/VM Performance Education**
  - Performance Workshop (No Charge for zVPS Users)
    - June (Binghamton University, New York)
    - November (Johannesburg)
  - One day Performance Management seminars world wide

Who is Velocity Software

27 years of growth
200+ Installations (zVPS)
22 countries (now, 28 countries registered for this webex!)
6 continents



zPRO Version 1 Functionality

zPRO Version 1 shipped 2010

- Implemented cloud (private PaaS) before cloud was a buzzword
- Full cloning support
- A LOT of web based management functions (RACF, SFS, Spool….)

System Status – Users, Spool, Devices

Manage users

- Cloning, Directory Maintenance, Expirations
- IP Address Maintenance, Free space, minidisk

z/VM Admin – SFS, RSCS

Security – RACF

HELP – z/VM (CMS, CP), zVPS DOC

Lessons learned from zPRO Version 1

Target Market – Who is it?

- Skills challenges
- Time challenges

Installation Challenges for “target market”

- Too complex (supporting 28 countries? NOT CHEAP)
- SMAPI “difficult”, requires installation and support time and skills
- Additional virtual machines added complexity

SMAPI (Systems Management API)

- Common interface for Linux
- Often the single most difficult part of zPRO installation
- Not necessary if using native z/VM

Java - Too heavy, device restrictive

Design objectives for zPRO Version 2

Fast Installation

- 10 minute Installation (Assuming zVPS installed)
- NO SMAPI!
- NO JAVA
- No Linux or MS servers required
- Any browser (no java enablement requirements)
- Fast setup

Directory Management, Security Support

- DIRMAINT or VM:Secure / VM:Direct
- VM:Secure or RACF or not

Release 2.1: Targets Self Service requirements

Design objectives for zPRO Version 2

Ease of use important, z/VM skills not needed

- Easy enough for an 11 year old to create his own server
  - “Dad, can I build my own Minecraft server on your mainframe?” (BC12)
- iPad
- smart phones
- Meet installation requirements

Non-invasive architecture

- No hooks, no dependencies
- Everything keeps running if zPRO removed
- (Automatic expirations would not happen)

“Managed Service” Management Requirements

Service Level Management (Performance Management)

- Chargeback functions
- Capacity Planning
- Operational Alerts
- Performance Analysis

zVPS Management Features

Performance Data Base (PDB) – Fully integrated

- z/VM (all subsystems, lpar, CPU, virtual machines)
- Linux on z (CPU, filesystems, process data)
- Network data (tcp, udp, ip, interface)
- Distributed servers (linux, MS, others)

Capacity Planning - Enterprise support

- PDB used by MXG, UIE, MICS

Operational Requirements

- zALERT – alert to email, text message, snmp, etc
- zOPERATOR – Management console
- Snmp alerts for enterprise console

z/VM Performance - zVPS

Traditional model (1989)

zMON: Real time analysis

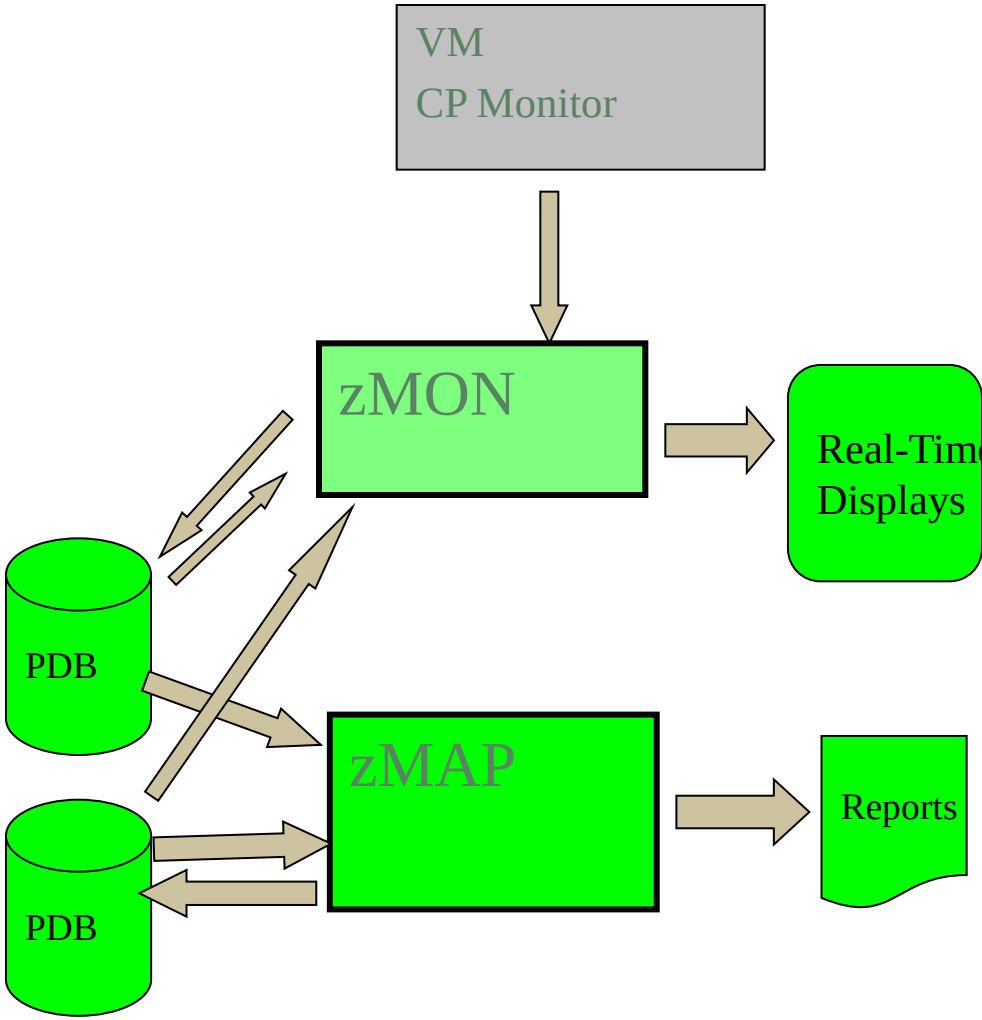
- Uses Standard CP Monitor

zMAP: Performance Reporting

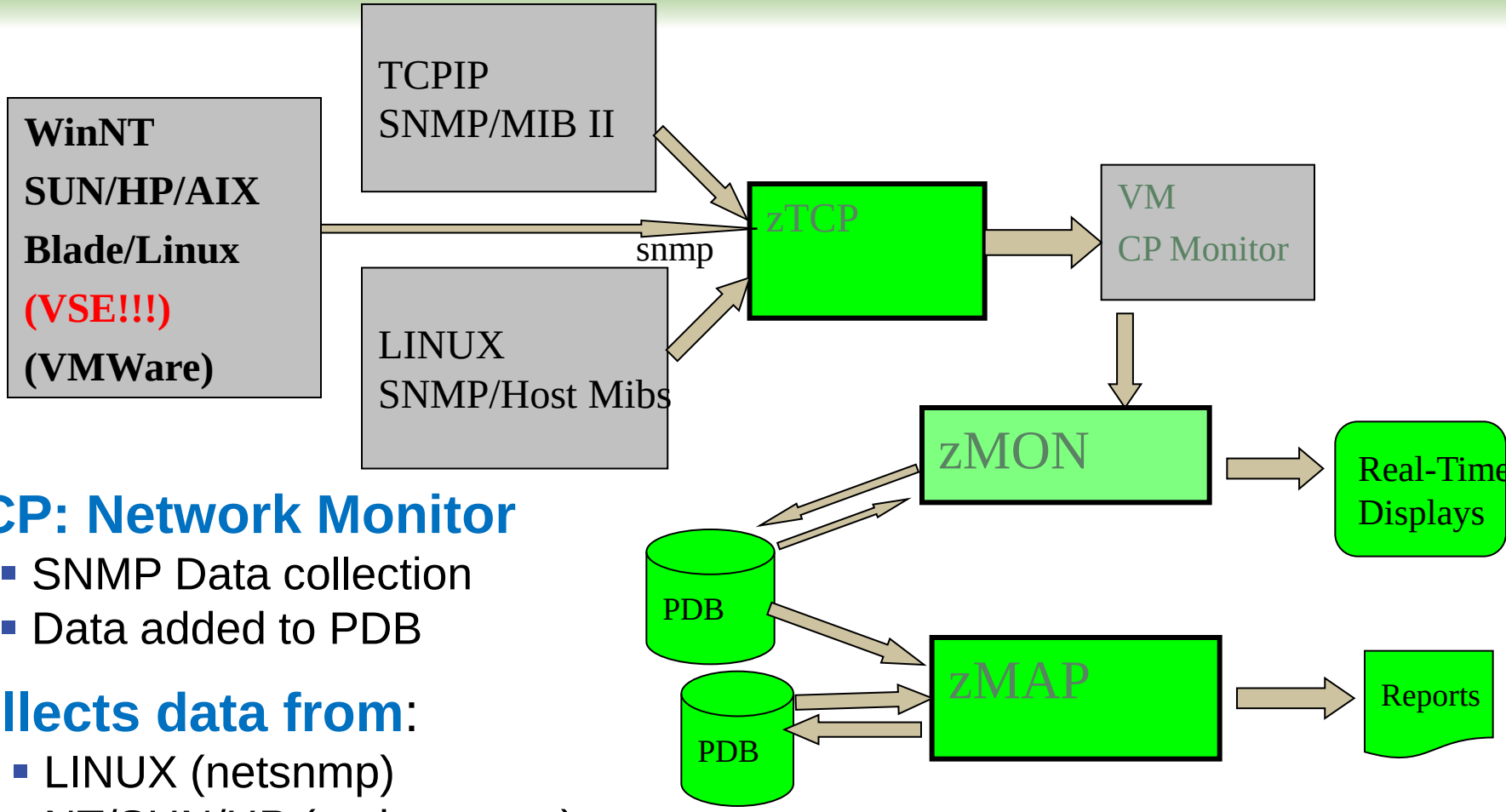
Post Processing
Creates Long Term PDB
PDB or monwrite data input

PDB (Performance DataBase)

Complete data
By Minute, hour, day
Monthly/Yearly Archive



Added Linux and Network Data Acquisition



zTCP: Network Monitor

- SNMP Data collection
- Data added to PDB

Collects data from:

- LINUX (netsnmp)
- NT/SUN/HP (native snmp)
- Printers/Routers….

Process Capture Ratio

- **High cpu capture ratio**

Screen: ESALNXV Velocity Software
1 of 1 LINUX Virtual Processor Analysis Repo NODE BLAKEMC

Time	Node	VM ServerID	<Linux Pct CPU> Total	Syst	User	<Process Data> Total	Syst	User	Capture Ratio
15:13:00	BlakeMC	BLAKEMC	15.9	0.1	15.8	15.9	0.1	15.8	1.000
15:12:00	BlakeMC	BLAKEMC	16.0	0.1	15.9	16.0	0.1	15.9	1.000
15:11:00	BlakeMC	BLAKEMC	16.1	0.1	16.0	17.0	0.1	16.9	1.061
15:10:00	BlakeMC	BLAKEMC	15.8	0.1	15.7	14.7	0.1	14.6	0.929
15:09:00	BlakeMC	BLAKEMC	16.1	0.1	16.0	17.3	0.1	17.2	1.074

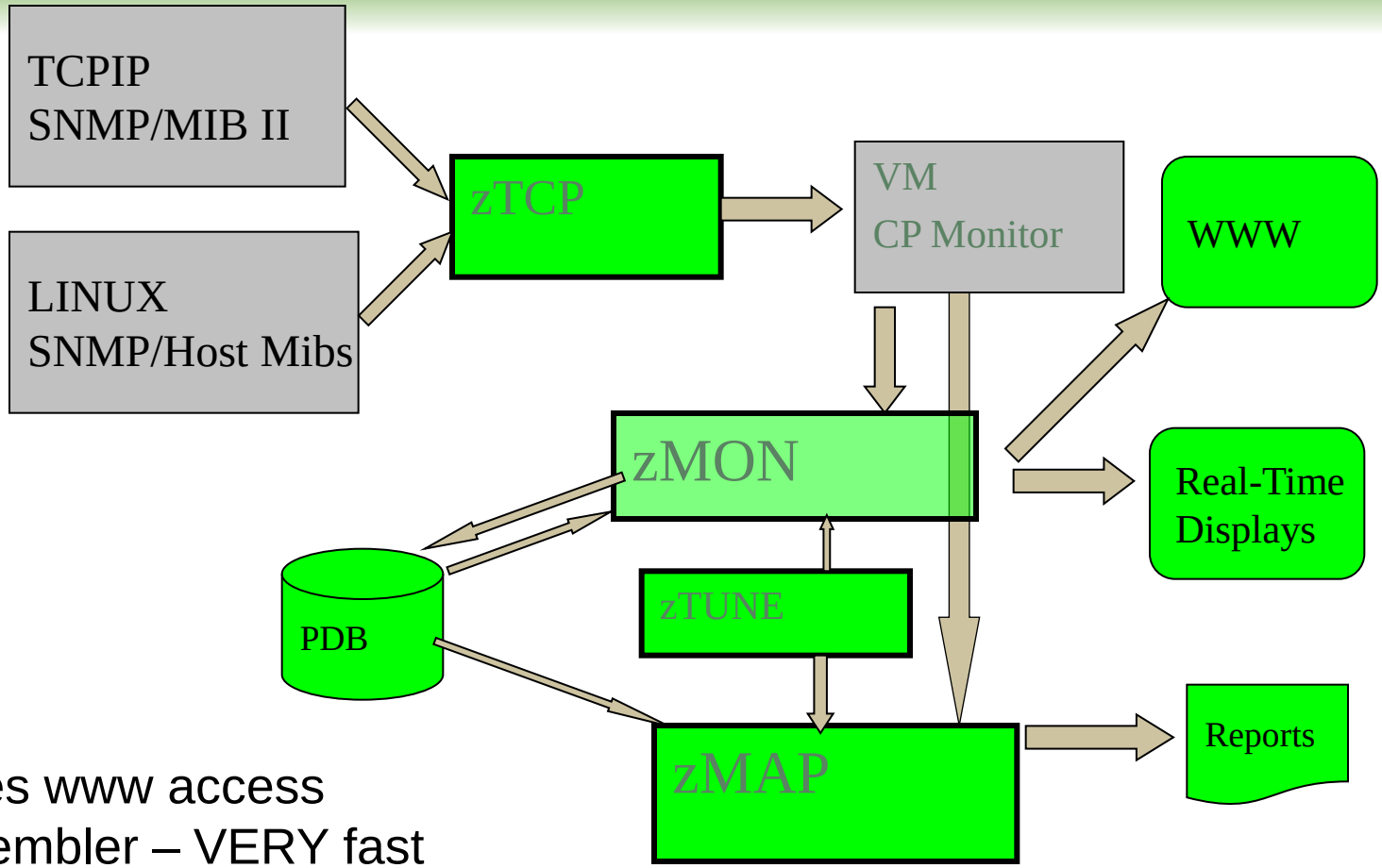
Screen: ESALNXP Velocity Software
1 of 3 VSI Linux Percent Usage by Process NODE BLAKEMC

Node	Name	<-Process Ident-> ID	PPID	GRP	nice valu	prty valu	<-----CPU Perc Tot	sys	user
15:01:00									
BlakeMC	*Totals*	0	0	0	0	0	15.0	0.1	14.9
	cron	2568	1	2568	0	20	0.0	0	0
	screen	6432	1	6432	0	20	0	0	0
	java	6500	9887	6500	0	20	14.9	0.0	14.8
	screen	9886	1	9886	0	20	0	0	0
	bash	9887	9886	9887	0	20	0	0	0
	snmpd	29210	1	29209	-10	10	0.0	0.0	0.0

Screen: ESALNXC Velocity Software
1 of 2 Linux Process Configuration

Node	PPID	PID	Process	Path
BlakeMC	1	2702	mingetty	/sbin/mi
	1	2703	ttyrun	/sbin/tt
	1	2704	agetty	/sbin/ag
	1	2705	agetty	/sbin/ag
	1	2706	agetty	/sbin/ag
	1	6432	screen	SCREENon
	6432	6433	bash	/bin/bas
	6432	6440	bash	/bin/bas
	6432	6447	bash	/bin/bas
	6432	6455	bash	/bin/bas
	6432	6462	bash	/bin/bas
	6432	48083	bash	/bin/bas
	6432	48116	bash	/bin/bas
	6432	48124	bash	/bin/bas
	6432	48712	bash	/bin/bas
	6432	48760	bash	/bin/bas
	6432	48769	bash	/bin/bas
	1	9886	screen	SCREEN01
	9886	9887	bash	/bin/bas
	9887	6500	java	javas-wo
	1	29210	snmpd	/usr/sbi
	1	48777	screen	screenas
	1	48778	screen	SCREENec
	1	48779	bash	/bin/bas
	1	48833	screen	SCREENas
	1	48834	bash	/bin/bas
	1	48887	screen	screenas
	48779	10142	screen	screenas

zVPS (Velocity Performance Suite)



zVWS Provides www access
Written in assembler – VERY fast

zTUNE: Rules based analysis, solve performance problems fast

zTUNE Performance Services

- 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 when ever installation requests, 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 on simplifying problem resolution
- Customer reports application people complain about zLinux performance:

```
Report: ESATUNE      Tuning Recommendation Report
Monitor initialized:
-------------------------------------------------------------
The following changes are suggestions by Velocity Software
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
```

Why Performance Analysis: Service Level Mgmt

- Diagnose real time service issues
- Manage “large” Shared resource environment
- Any application may impact other applications

Infrastructure Requirements

- Analyze all z/VM Subsystems in detail, real time
  - (DASD, Cache, Storage, Paging, Processor, TCPIP)
- Analyze Linux
  - (applications, processes, processor, storage, swap)
- Historical view of same data important (What changed?)
  - Why are things worse today than yesterday?
  - Did adding new workload affect overall throughput?

Challenges With Linux Performance Management

1. Operational cost of infrastructure

- 2% of a CPU per server costs 1 IFL per 50 servers,
- Velocity uses snmp, targets less than .1% of ONE processor with one minute data collection per Linux server
- Netsnmp enhancements provided. (SUSE includes 1st release)

2. Accuracy and integration of data

- Virtualized CPU accounting must be normalized
- Correlate Linux system data, Linux process data with z/VM data

3. Capture ratios

- Data must be complete to be useful for full performance management
- Target 100% capture ratio to process level

4. Skills

- Skills are lacking, access to skills critical when there are performance problems.

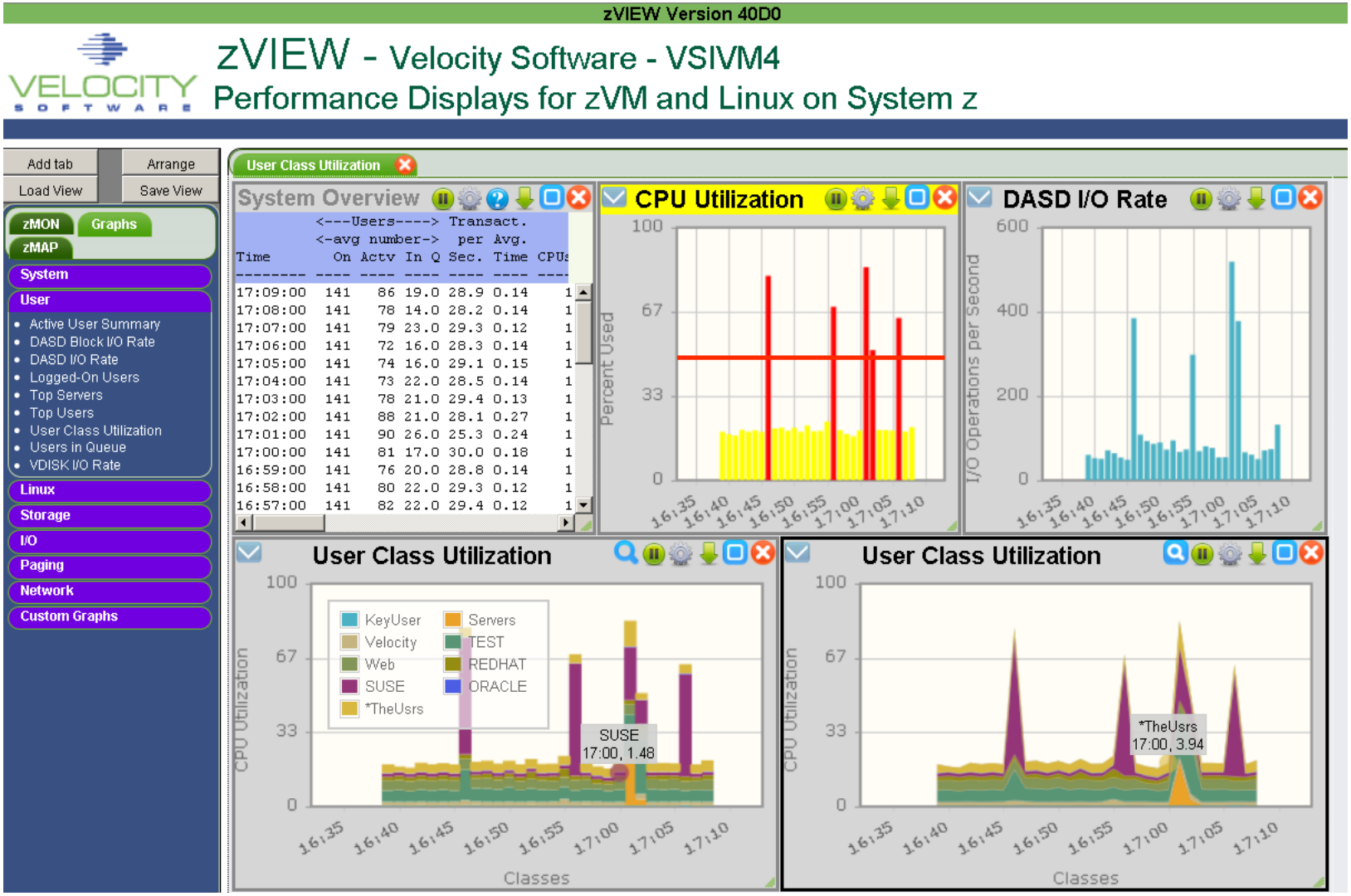
Linux Requirements Summary

- **Linux (virtualized) and networks add requirement**
  - **Correct data**
  - **Complete data**
  - **Low cost data**
- **Support requirements:**
  - z/VM 3.x, 4.x, 5.1, 5.2, 5.3, 5.4, 6.1, 6.2, 6.3 (+z13)….
  - SLES 7,8,9,10, 11 (Installations still have 7 and 8)
  - RHEL 3,4,5, 6
  - Other platforms in enterprise (VSE, VMWare, SUN, P, MicroSoft)
- **Must support performance management:**
  - Performance tuning
  - Capacity planning
  - Operational alerts
  - Chargeback/Accounting

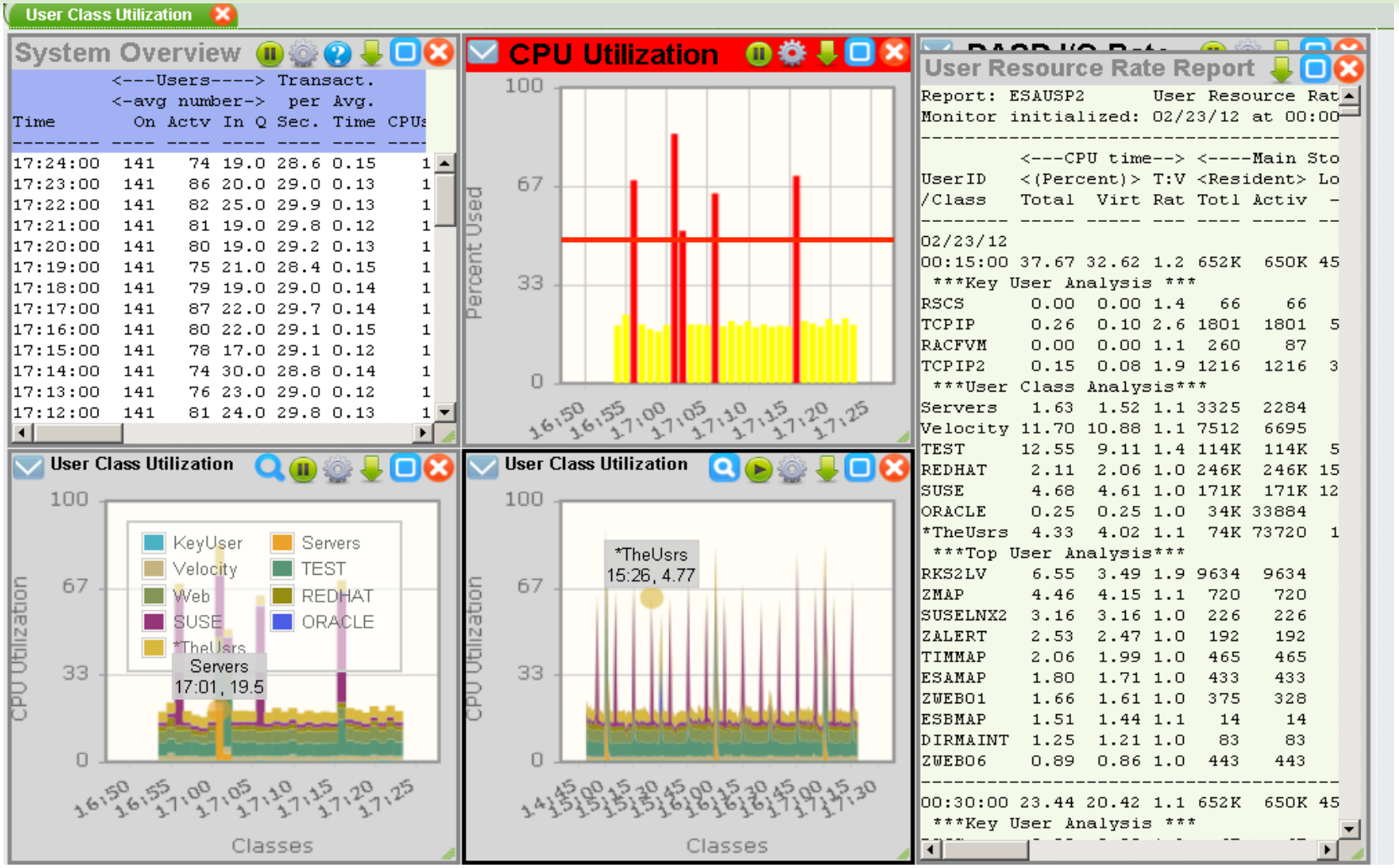
zView – Browser based user interface

- **zVWS – Velocity Software WebServer**
  - Native z/VM,
  - Assembler, VERY VERY FAST
- **Web server applications**
  - zView, zPro, Portal, zAlert, zOperator
  - VelocitySoftware.com, LINUXVM.ORG, etc
- **zVIEW:**
  - Graphical, browser based, no java
  - Live demo: “demo.velocitysoftware.com/zview/zview.cgi”

How do YOU view performance?



Display Everything, How about yesterday?

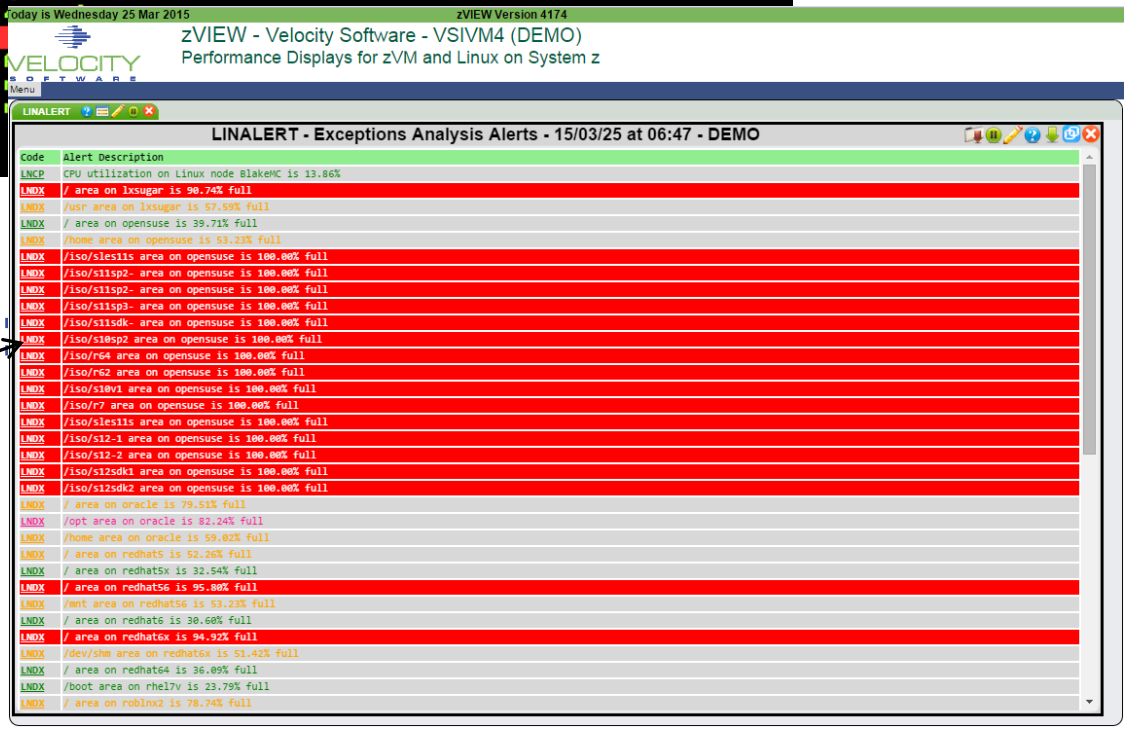


zALERT – Automate problem detection

3270 Style Alerts (50+ sample alerts provided)

```
 Screen: LINALERT              Velocity Software              25 Mar 2015 06:42:29
------------------------- Exceptions Analysis Alerts -------------------------

    Type Description
    LNDX / area on oracle is 79.51% full
    LNDX /opt area on oracle is 82.24% full
    LNDX /home area on oracle is 59.02% full
    LNDX / area on RH5X161 is 32.54% full
    LNDX / area on S11R20RA is 81.56% full
    LNDX /boot area on S11R20RA is 2
    LNDX /opt area on S11R20RA is 95
    LNDX /mnt/oracle area on S11R20R
    LNSU Swap utilization for Linux
    LNSU Swap utilization for Linux
```

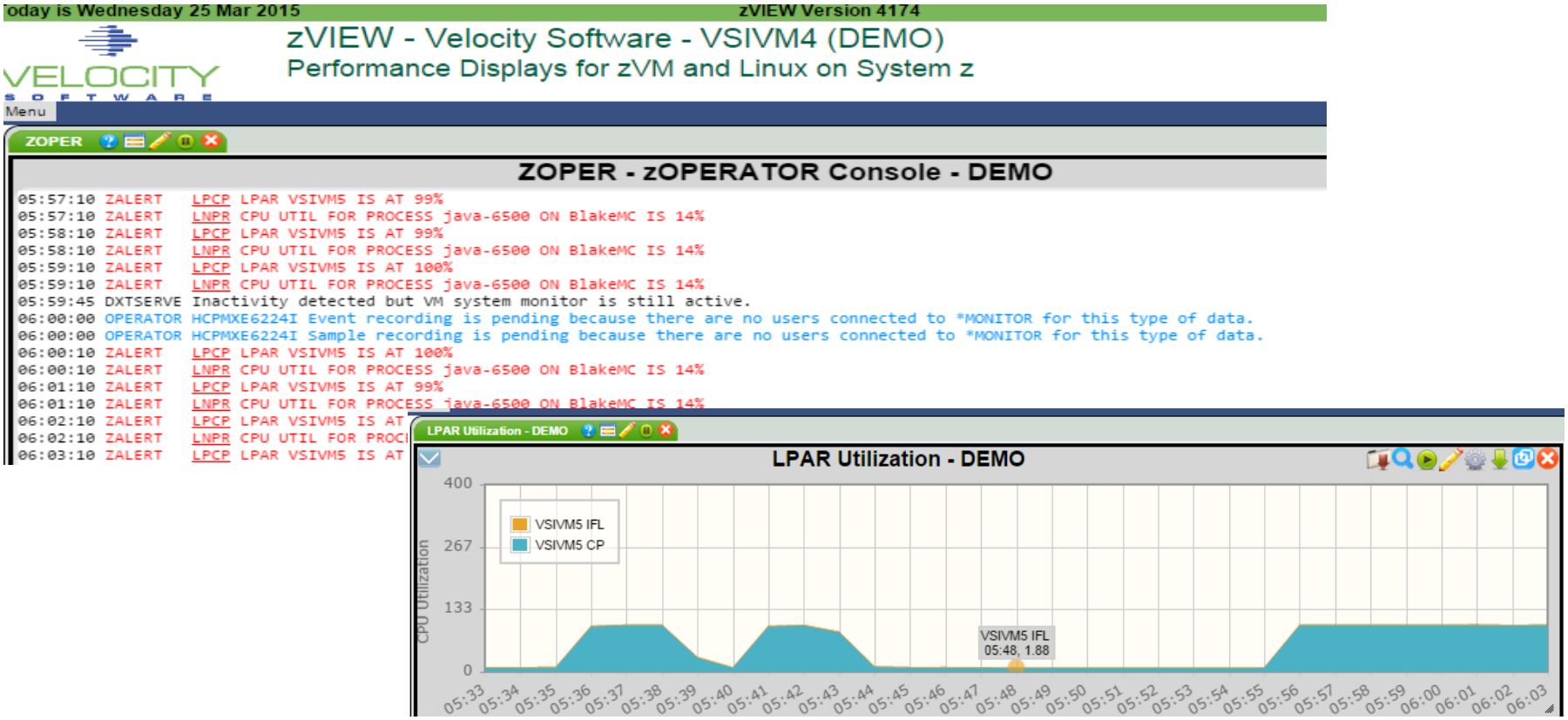


Or Browser based Click Thru or SMS, email…

zOPERATOR – Management Console

Operator Function browser based

- Click Thru for problem analysis – LPCP example



Self Service / Cloud Infrastructure Summary

Performance management Provided by zVPS

- Chargeback functions – Complete data source
- Capacity Planning – Full PDB
- Operations - zALERT, zOPERATOR
- Performance Analysis – zVIEW, zTUNE

Security and Directory Manager Options

- RACF, VM:Secure, native z/VM
- Dirmaint

zPRO Version 2.1 Installation

ZADMIN Virtual Machine

- needs class A for xautolog and force (Or change priv cmd class)
- RACF / VMSecure authority if controlled environment
- SFS Authority to enroll users

Other - Did I remember to say no smapi???

RACF / DIRMAINT Administrators are pre-defined

- ZVPS, BARTON, TONY

“Golden Images” exist

- GOLDVM, GOLDLXRO, GOLDCMS, GOLDLXFB
- (z/VM golden image, Read-only linux, Class G CMS user, Linux guest using FBA)
- (minecraft internal only)

DASD groups defined to directory manager

- DEMOECKD DASD group for ECKD cloning
- DEMOFBA DASD group for FBA cloning

Self service user authorization (“demousr ZPUSER”)

```
/* Quotas
group: demo
account: ss0001 ss0002 ss0003 ss0004

auth: user clone run delete
auth: selfserv control
auth: eckd-grp demoeckd
auth: fba-grp  demofba

userlist: DEMO*  GOLD*
/* Privileges
menu: selfserv.create selfserv.password selfserv.startusr
menu: selfserv.stopuser selfserv.modify  selfserv.deluser
menu: selfserv.quota
```

Self service group definition (“DEMO ZPGROUP”)

```
/*
/*  Resource limits
/*
osa_Max: 30
IP_Max: 10
dasd_Max: 20
fcp_Max: 20
vcpu_Max: 50
storage_Max: 100
user_Max: 10
mdisk_Max: 20
```

zPRO Version 2.1 Installation

Install zPRO

Download, Configure product, install (1-2 minutes)

Update ZADMIN authorities (from DIRMAINT authorized user)

```
Add Privilege class “A”
Add OPTION LNKNOPAS
Add IUCV ALLOW statement
DIRM SEND AUTHFOR CONTROL, receive, edit, add “ZADMIN”
DIRM FILE AUTHFOR CONTROL
Issue DIRM RLDCODE
```

RACF authorization to create server profiles

```
RAC ALTUSER ZADMIN SPECIAL OPERATIONS
```

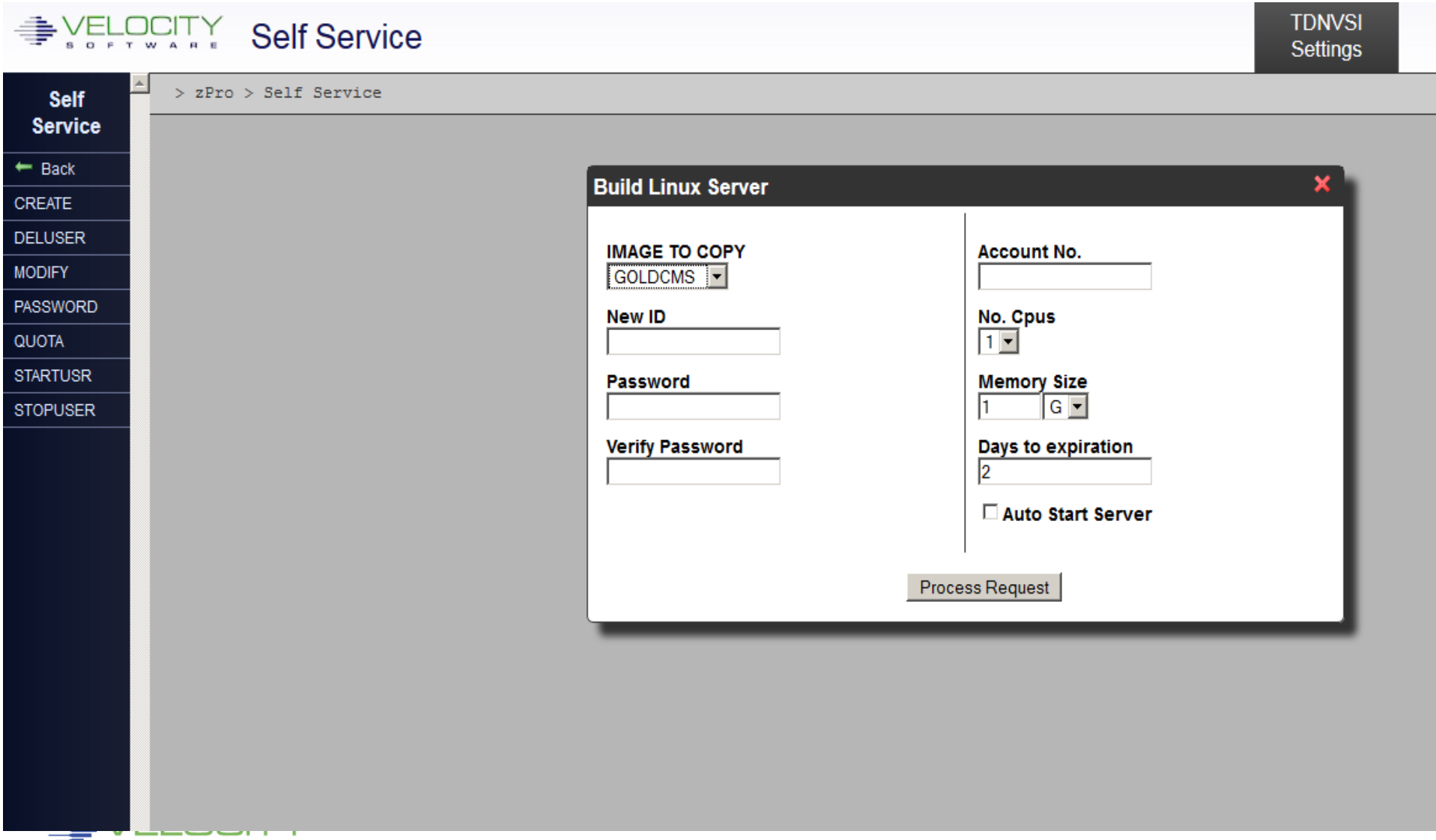
Logon to ZADMIN, remember password

```
STOP
DIRM NEEDPASS NO
```

Restart web servers

Browser: “demo.VelocitySoftware.com/zprov2”

zPRO V2 Build a guest from a Golden Image



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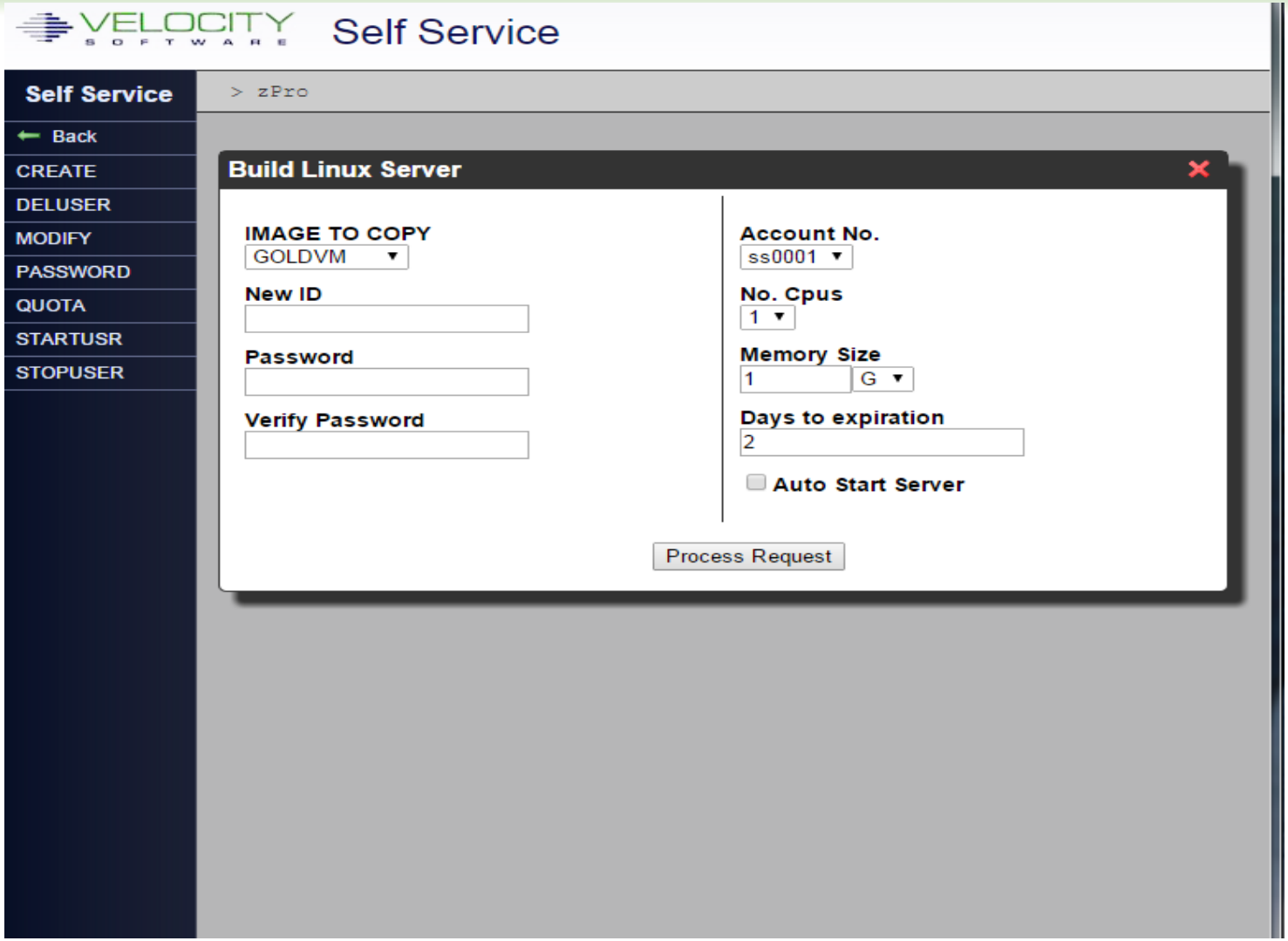
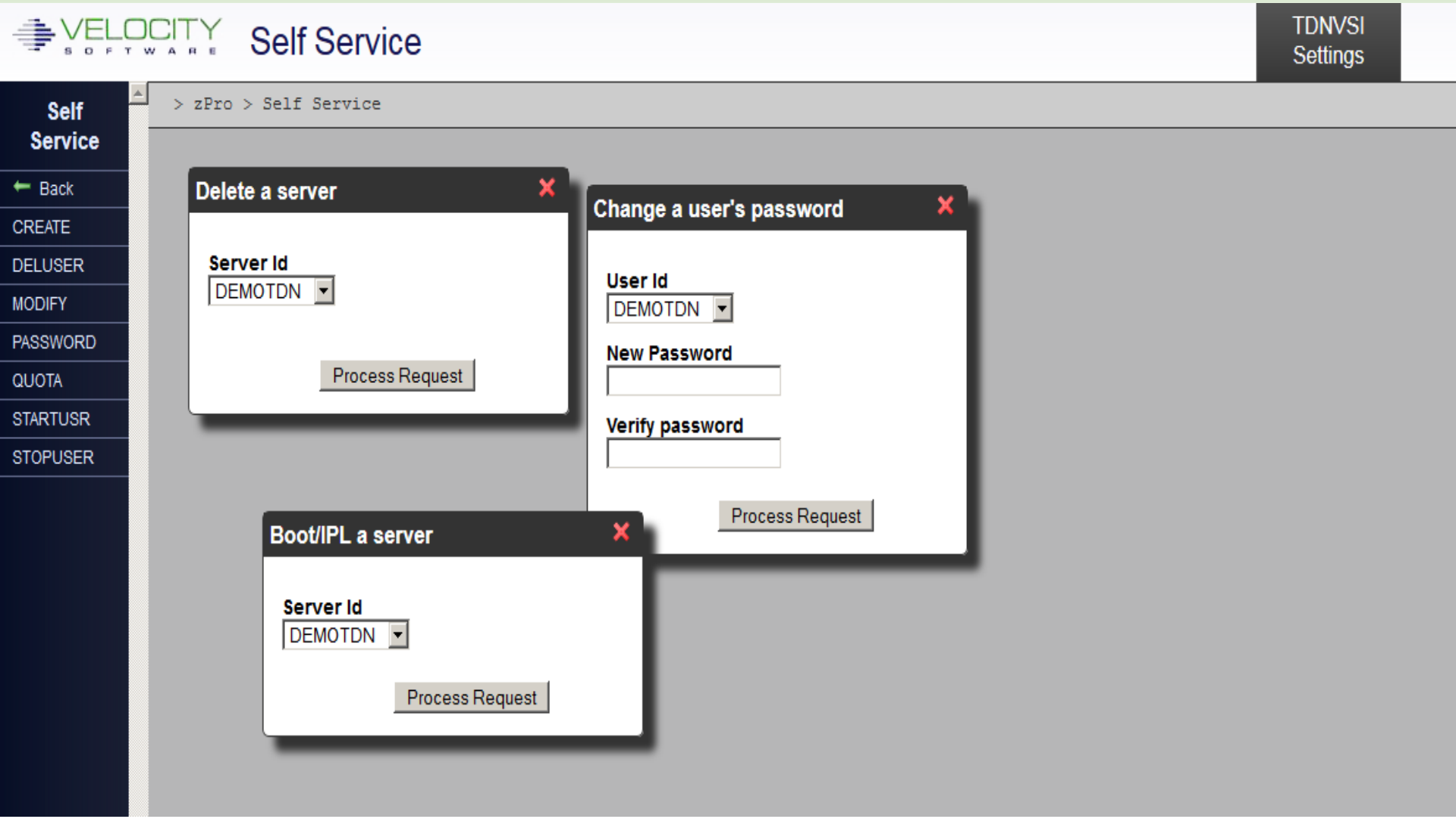
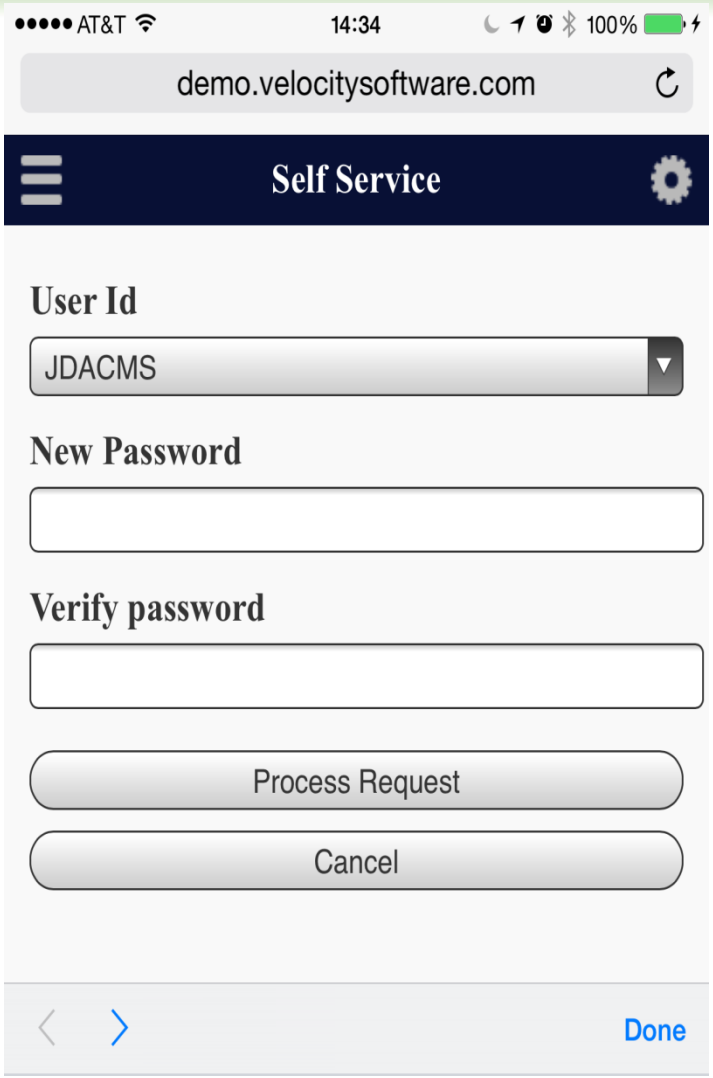


zPRO V2 Self-Service Multi-tasking



zPRO V2 Self-service Mobile (iPhone, iPad)



VELOCITY SOFTWARE

PROVEN PERFORMANCE

Trials

- **No charge trial zVPS**
  - Onsite Installation support
  - Performance analysis included
  - Two hour installation time (zVPS)
- **No charge trial zPRO**
  - 10 minute installation time (zPRO)
  - zVPS customers can download for free for 30 days
  - 1st 30 installations receive $10K/CEC/year pricing model
  - New installations, contact: sales@VelocitySoftware.com

Our challenge – you are all too busy…

… busy fighting your own battles

Thank you for attending

"I don't have time to see any crazy salesman; I have a battle to fight."

Please contact Sales@VelocitySoftware.com