Modernizing z/VM with zPRO, On prem cloud on IBM Z

www.VelocitySoftware.com
www.LinuxVM.com

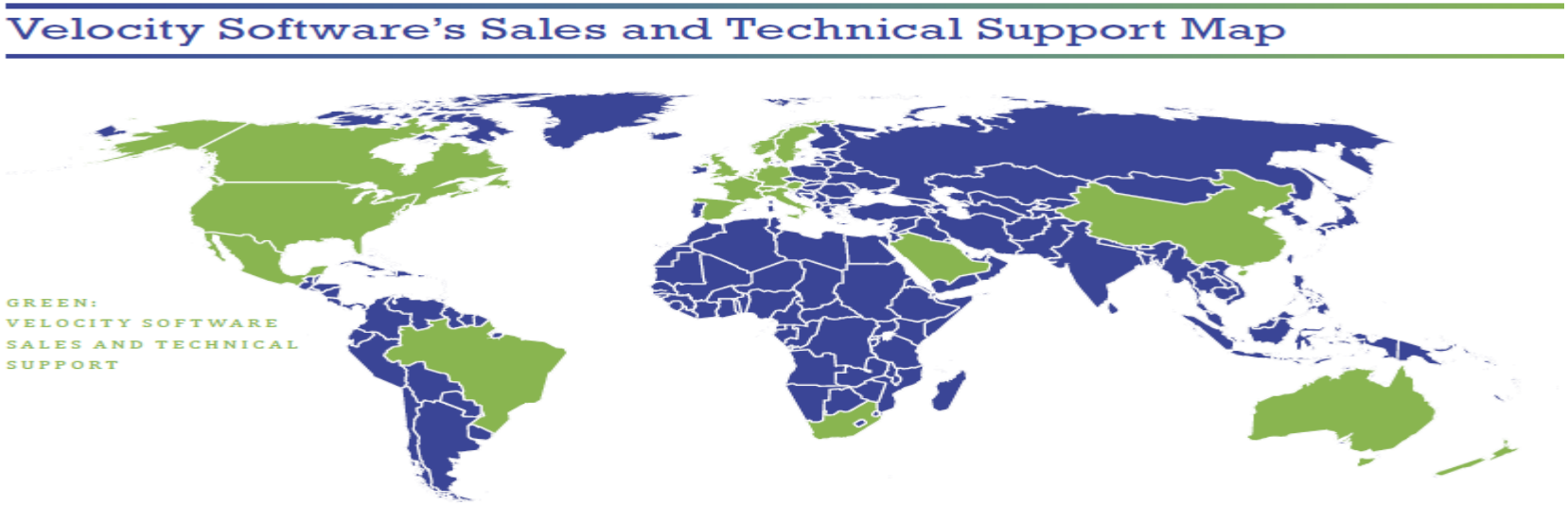
Barton Robinson, CTO, Velocity Software

Topics

- **Who is Velocity Software**
- **Why zPRO**
- **zVWS – the z/VM Native Web Server**
  - Fast, powerful, modernizing, required in this century
- **Simplify your environment with on prem cloud**
  - zPRO – On-prem Private Cloud

Who is Velocity Software

Founded 1988,
Mission: Provide software to assist customers in optimizing the VM platform:
Continuous fully integrated enhancements over 30 years
200+ Installations (zVPS) (more than z/VM ½ IFLs world wide)
22 countries, 6 continents



Industries using Linux and Velocity Software

Banking, Financial:

Government / Military:

Health Care, Insurance, Retail

Manufacturing: Automotive, computing, Oil

Outsourcing

Velocity Software product set

zVPS: Performance Management Suite, includes:

- zVIEW: Web based Graphical Performance Displays
- zMON: Real-time Monitor
- zMAP: Historical Reports
- zTCP: Network Performance Data Collection
- zVWS: High Speed Native Web Server for z/VM
- zOPERATOR: Full Operator Console
- zALERT: Full Operations Alert Support
- zPORTAL: Web application to manage certain zVPS functions

zTUNE: Rules Based Analysis and Performance Services

zOSMON: z/OS Performance Monitoring

VSEMON: z/VSE Performance Monitoring

zPRO: Cloud Enablement for z/VM and Linux on IBM Z

Why zPRO?

Customers want simple

- Few z/VM Skills
- Little Time

Customers want on Prem Cloud

- Reduces Skills requirements
- Reduces Time requirements for server build / management

I want it now….

- zVPS installs in 2 hours for 1st LPAR
- zPRO Installs in 10 minutes on top of zVPS
- zPRO Tailors in 2 hours
- Usable by everybody concurrently that is authorized
- Clones servers in seconds (assuming flash copy)

zVWS – The Velocity Software Webserver

Modern means “internet”

zVWS Developed (1998) for native z/VM web pages

- VelocitySoftware.COM
- Linuxvm.ORG
- Other user groups

Developed to be very very fast

- VelocitySoftware.com hosted on z/VM on p390 (18Mhz)
- Written in assembler – running on z, fastest server possible
- Built in security is important too

Many customers have built zVWS applications

- Used by DOD for secure client certificate
- Used by banks for financial applications
- Used by government agencies for serving critical applications
- State government uses zVWS to server state legislature
  - **(if zVWS goes down, state government goes down)**

zVWS – The Velocity Software Webserver

zVWS is very simple – secure, reliable, and elegant

- Web servers single threaded to maintain reliability
- VERY small foot print per server (32mb) – compare to http process….
- 5 servers (160mb) sufficient for most applications
- Security via SSL, now using IBM SSL/TLS (HTTPS)

What can be served?

- All forms of HTML, PDFs, CGI
- CSL, Java script, JAVA (no server side java, no “dot net”)

What CGIs can be developed?

- Anything that runs in CMS (EXEC, REXX, Assembler, PL/1….)

zVWS is very powerful, very simple modernizing engine

- General purpose
- Flexible

zVWS – Samples

zVWS is z/VM native generalized webserver

- Multi-application
- Full access to CP, CMS, z/VM Applications!
- zVIEW, zOPERATOR, zALERT, zPORTAL, zPRO…..

Easy samples

- Issue any browser issued CP command in 25 lines of code

  http://192.168.5.43/**cpform.html**
- Interface to DIRMAINT to look at directory entries
- http://192.168.5.43/**dirmform.html**
- Interface to view a file on a browser

  http://192.168.5.43/**view?fn=showdirm&ft=CGI**

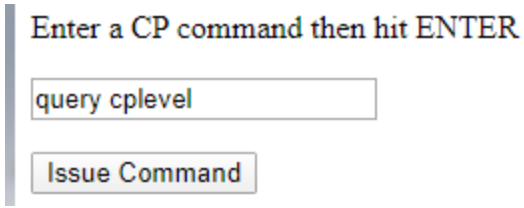
zVWS – Customers want simple

CPFORM HTML

```
<html><head>
<title>Issue a CP command</title>
</head><body>
<form action="showcp.cgi"
  method="post" enctype="multipart/form-data">
<p>Enter a CP command then hit ENTER</p>
<input type="text" name="cpcommand"
  placeholder="CP command" />
<p>
<input type="submit" name="b1" value="Issue Command" />
</form></body></html>
```

SHOWCP CGI

```
/* How much easier can it be? */
  cpcommand = ''
  'GETARGS'
  'OUTPUT <html><body><pre>'
  If cpcommand = '' Then
    'OUTPUT You must enter a command'
  Else
    Address 'COMMAND' 'PIPE (endchar ? Name
                              SHOWCP:1)',
        '| VAR CPCOMMAND',
        '| XLATE',
        '| CP',
        '| OUTPUT'
  'OUTPUT </pre></body></html>'
```




```
z/VM Version 7 Release 1.0, service level 1902 (64-bit)
Generated at 11/20/19 10:51:20 PST
IPL at 12/08/19 04:22:46 PST
```

zVWS – Customers want simple

SHOWDIRM CGI

dirmform html

```
<html><head>
<title>Issue a DirMaint Command</title>
</head><body>
<form action="showdirm.cgi"
  method="post" enctype="multipart/form-data">
<p>Choose a DirMaint Command</p>
<p><input type="submit" name="b1" value="TERM ?" />
   <input type="submit" name="b1" value="DATEFORMAT ?" />
   <input type="submit" name="b1" value="DEFAULTS ?" />
   <input type="submit" name="b1" value="IPL ?" />
   <input type="submit" name="b1" value="SCREEN ?" />
</form></body></html>
```


```
/* How much easier can it be? */
  Parse Value '' With b1 b2 b3 b4
  'GETARGS'
  'OUTPUT <html><body><pre>'
  If b1 = ''
    Then 'OUTPUT You must choose a command'
    Else Do
      Call Diag 8,'SET MSG IUCV'
      Call Diag 8,'SET VMCONIO IUCV'
      Address 'COMMAND' 'PIPE (NAME QPRT02 ENDCHAR ~)',
         '| STARMSG *MSG EXEC DIRMAINT' b1,
         '| SPECS 17-* 1',
         '| PICK 1.1 == /D/',
         '| OUTPUT',
         '| ALL / RC/ ! /complete;/',
         '| C: FANINANY',
         '| SPECS /PIPMOD STOP/',
         '| SUBCOM CMS',
       '~ LITERAL +00:02',
         '| DELAY',
         '| C:'
      Call Diag 8,'SET MSG ON'
   End
  'OUTPUT </pre></body></html>'
```

```
DVHXMT1191I Your IPL request has been sent for processing to DIRMAINT at
DVHXMT1191I VSIVM3.
DVHREQ2288I Your IPL request for ZWEB05 at * has been accepted.
DVHIPL3274I The current IPL setting for ZWEB05 is CMS with PARMS of
DVHIPL3274I FILEPOOL VMSYSVPS:
DVHREQ2289I Your IPL request for ZWEB05 at * has completed; with RC = 0
```

zVWS – View a file

VIEW CGI

```
/***/
  Parse Value '' With fn ft
  'GETARGS'
  'OUTPUT <html><body><pre>'
  If fn ft = '' Then
    'OUTPUT You must send the file to view'
  Else
    Address 'COMMAND' 'PIPE (endchar ? name SHOWCP:1)',
       '| FILEFAST' fn ft 'VMSYSVPS:ZVWS.ROOT',
       '| CHANGE /</ /&lt;/',
       '| CHANGE />/ /&gt;/',
       '| OUTPUT'
  'OUTPUT </pre></body></html>'
```

http://192.168.5.43/view?fn=showcp&ft=CGI

```
/* How much easier can it be? */
cpcommand = ''
'GETARGS' 'OUTPUT <html><body><pre>'
If cpcommand = ''
Then 'OUTPUT You must enter a command'
Else Address 'COMMAND'
'PIPE (endchar ? name SHOWCP:1)',
'| VAR CPCOMMAND',
'| XLATE',
'| CP',
'| OUTPUT'
'OUTPUT </pre></body></html>'
```

zVWS – Simple Summary

Native z/VM WebServer

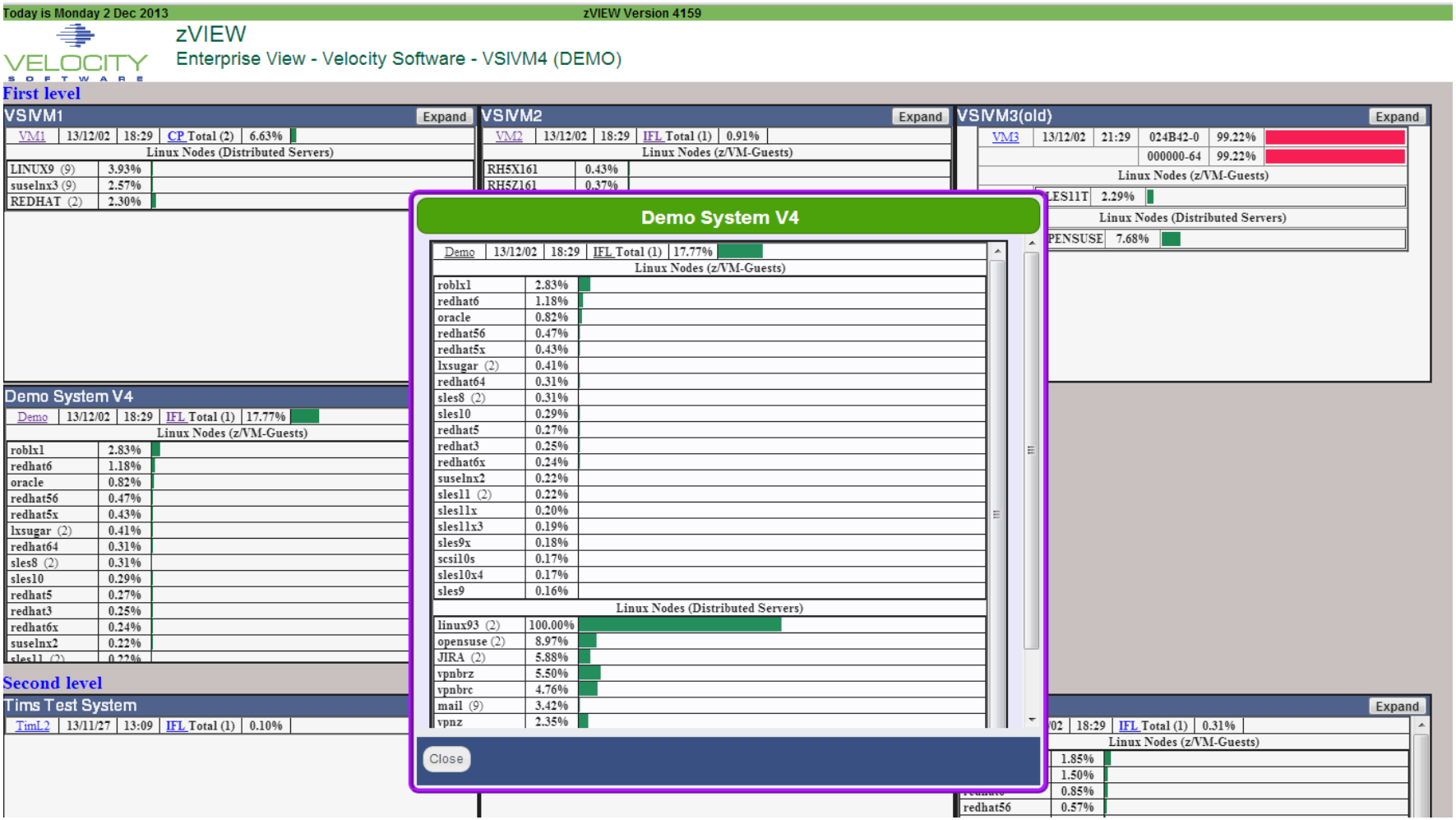
- CP/CMS Commands
- Dirmaint commands
- RACF commands

Velocity Applications

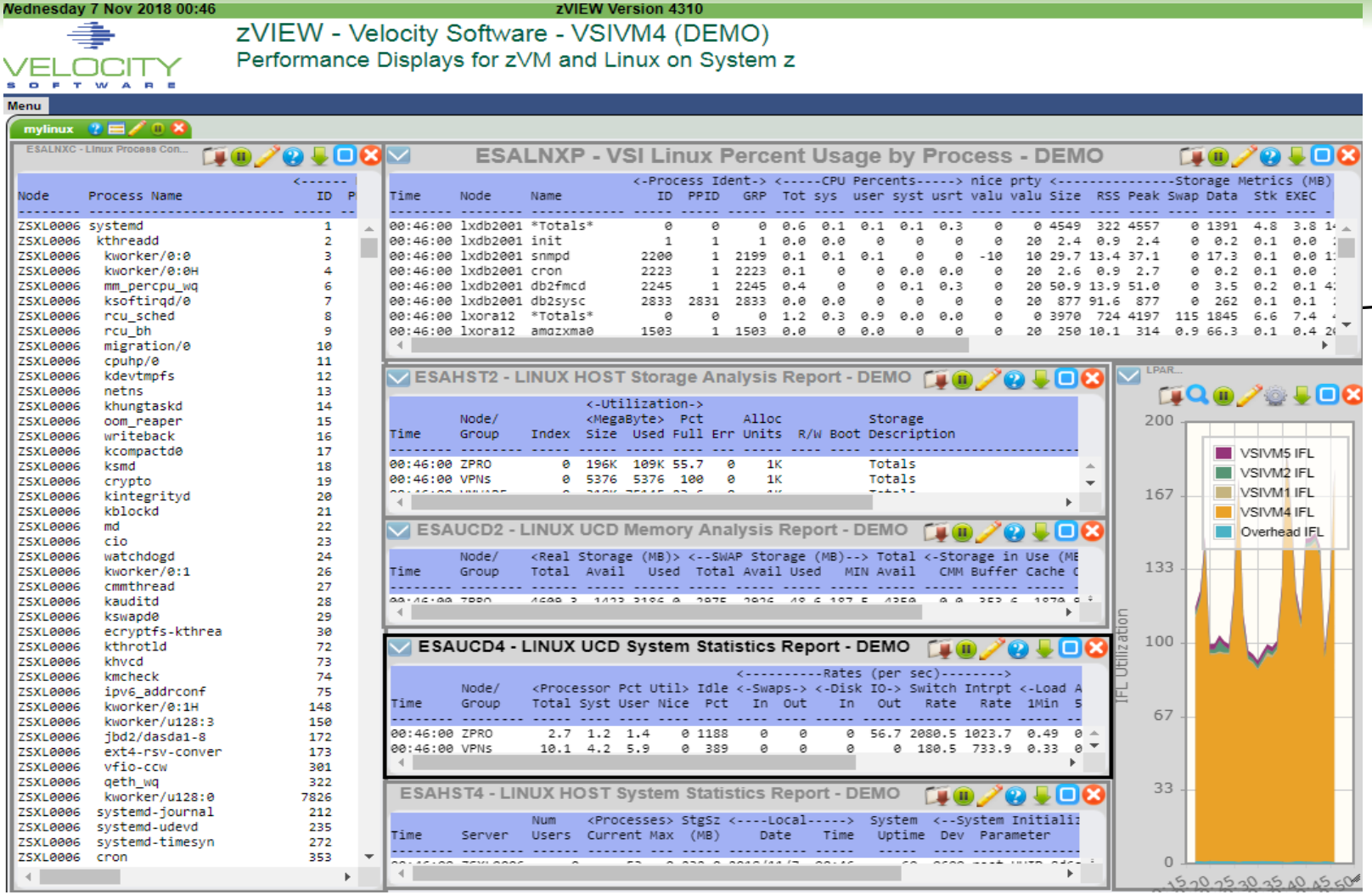
- VelocitySoftware.com (corporate website)
- zVIEW (z/VM, Linux, z/VSE, z/OS, distributed)
- zPortal
- zPRO

zVPS Enterprise View – All LPARs in Enterprise

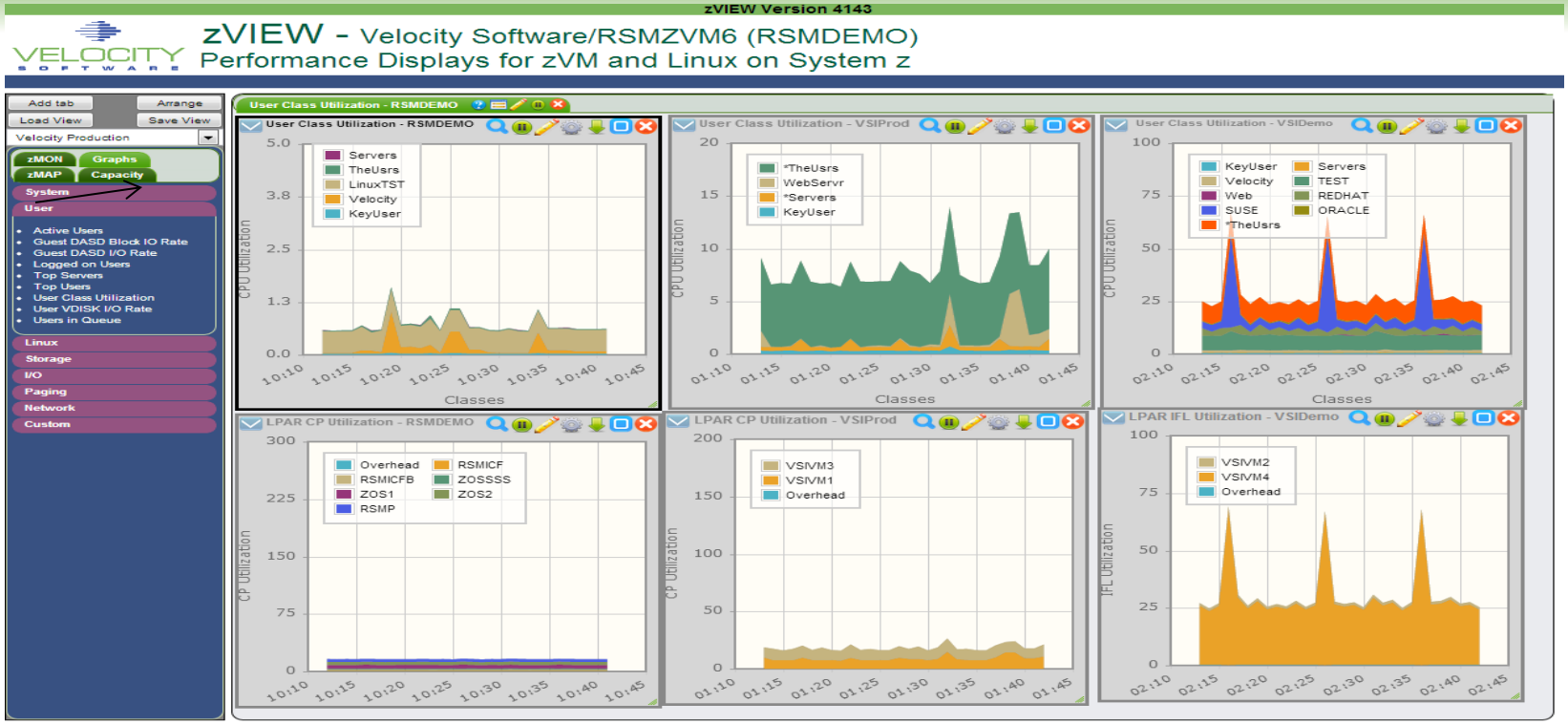
Tailorable, expandable, zoomable



zVIEW Linux performance “portal”



Multiple System RealTime View (3 LPARs)



Data from multiple lpars visible on “Single pane of glass”

zPRO – on-prem cloud

Challenges with z/VM: “we want cloud”

- Lack of z/VM skills
- Old style interface (3270)
- Linux on hardware seems easier
- KVM seems easier (but z/VM performs and scales better)

zPRO Objectives – build on native webserver capability

- Modernize the z/VM Platform
- Simplify z/VM management
- Server life cycle management
- Provide Systems programmers with simple to use management tools
- Provide end users simple access
- RESTFUL APIs…..

z/VM Challenges (for all sites)

Directory Management

- Often bottleneck in creating/modifying servers
- Who is allowed?

Operations

- Starting / Stopping servers
- Who can do it? Server owners

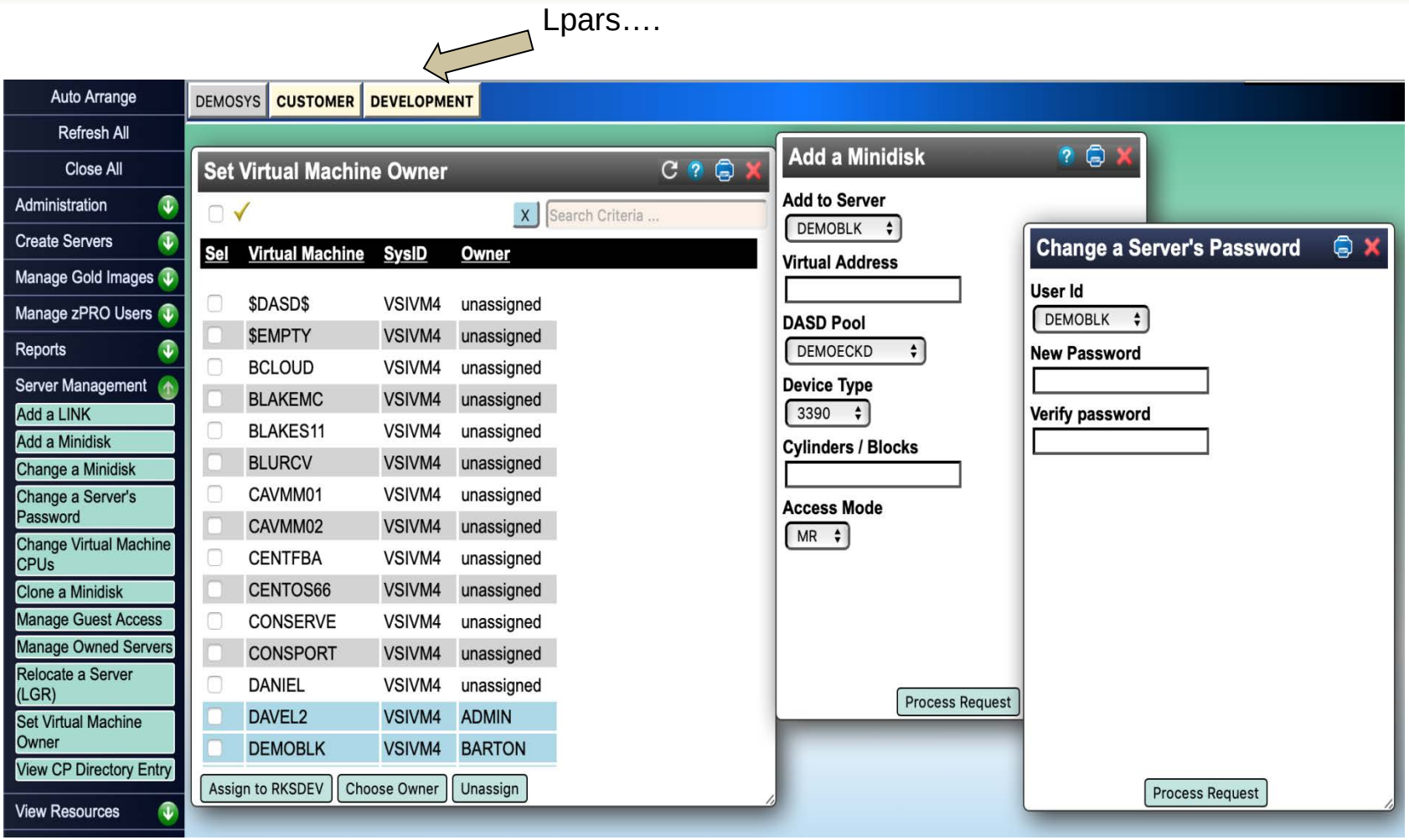
Systems Management

- See available resources
- See servers / server ownership

zPRO for end users

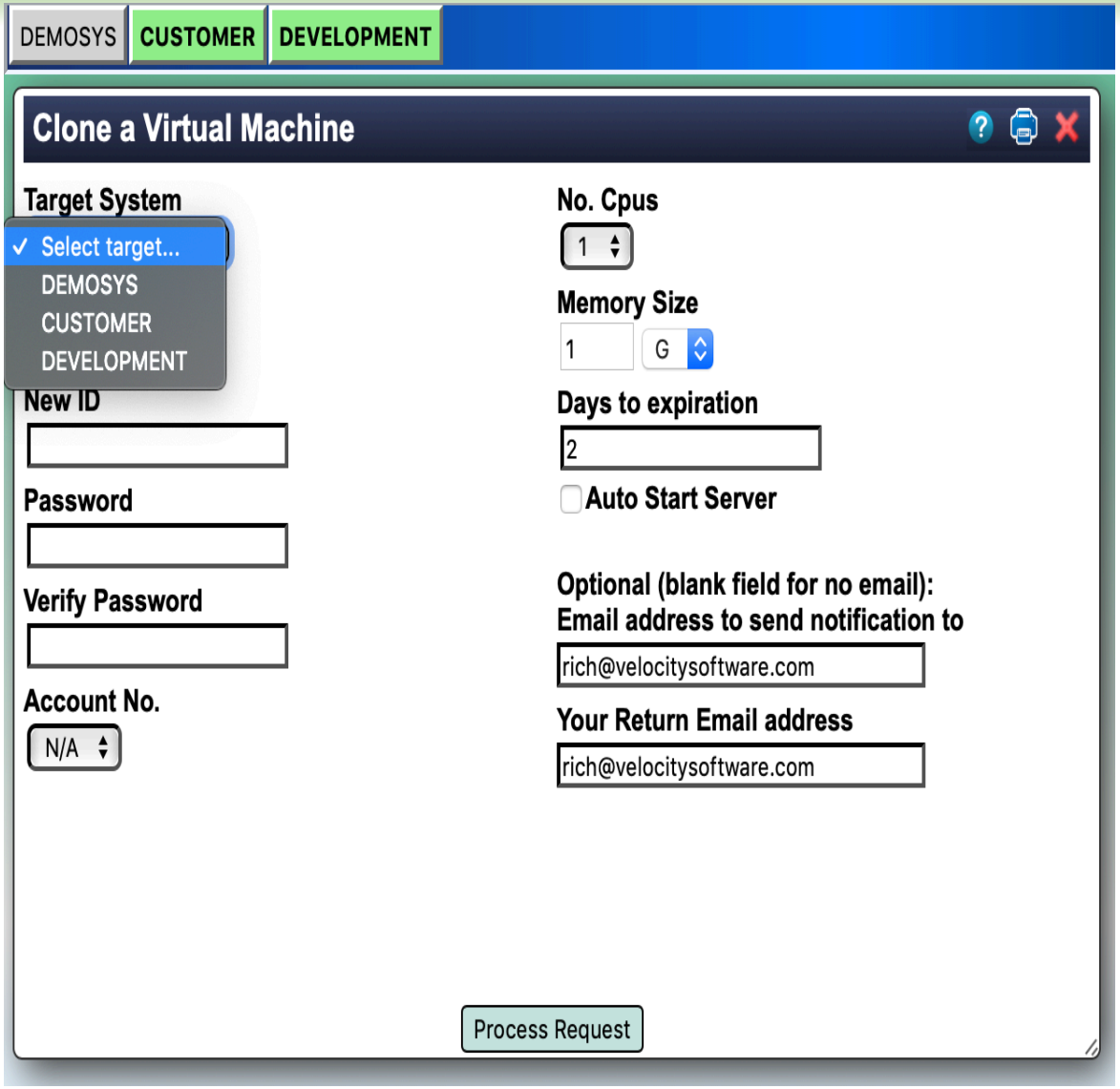
- **z/VM Cloud Server Management**
  - Clone (provision), modify, start, stop, move, delete servers
    - Linux w/Oracle, Websphere, etc – any z/VM guest
  - Define server expirations (life cycle management)
    - Useful for LAB, test or proof-of-concept servers
  - Selective resource controls and quota management
    - Hierarchical control from global, to group, to user to server
  - SSI / LGR (live guest relocation) support

zPRO Server Management web page



End user Enterprise Functions

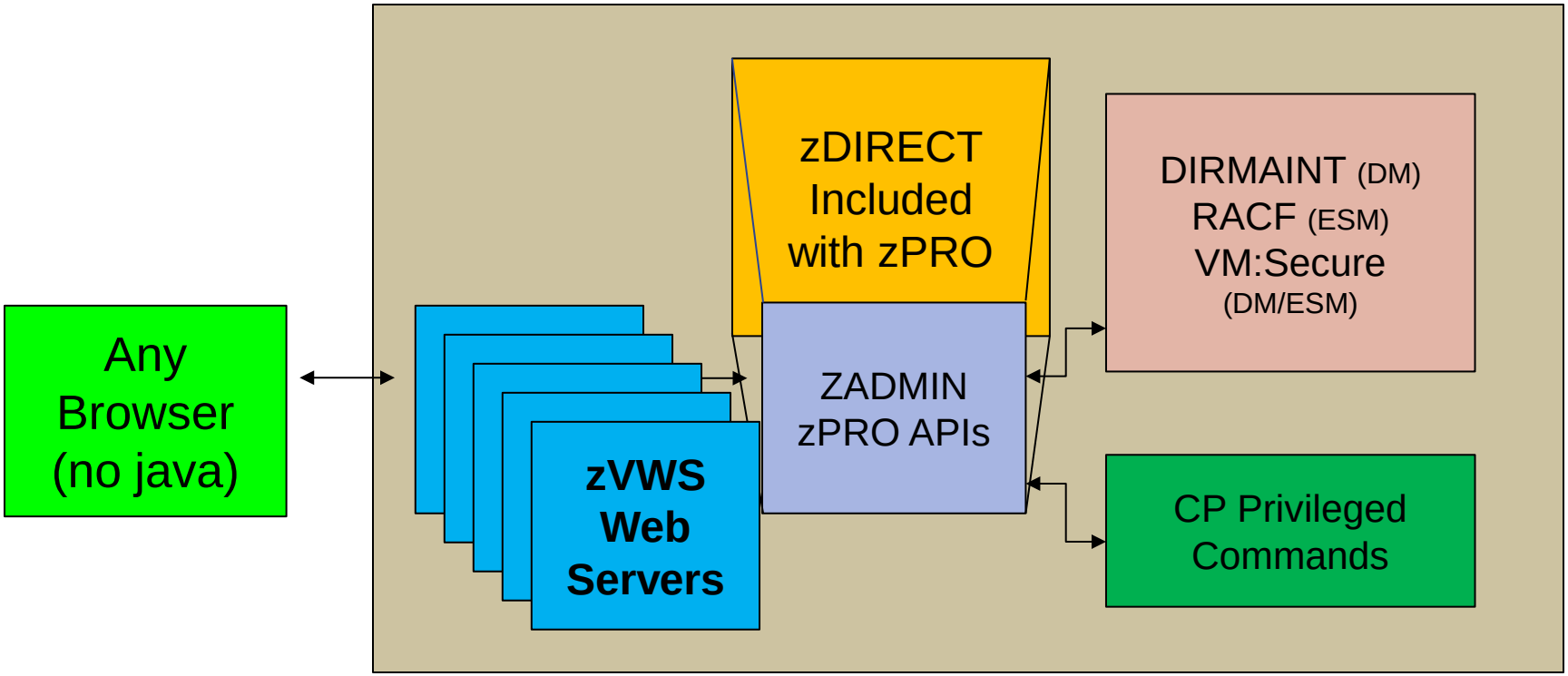
zPRO dialogs present a list box to select on which system to perform the function.

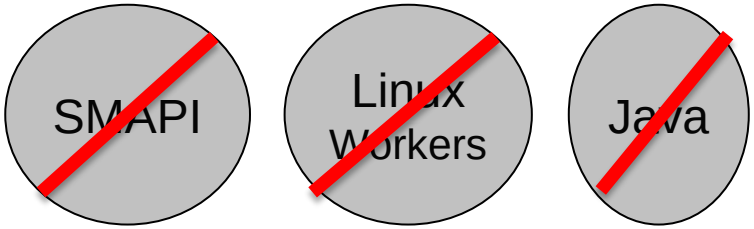


zPRO support for platform

- **Utilizes the zVWS *native* z/VM web server**
  - UI is completely browser-based
  - (no Java!, nothing installed on workstation)
  - **Installs in about 10 minutes onto zVPS managed LPAR**
- **Authentication support via zVWS**
  - VM / LDAP / AD / your own
- **Extensible**
  - Can define and “plug in” site-defined services
  - Easily tailored by z/VM systems programmers
  - **RESTFUL APIs**
- **Provides directory management**
  - zDIRECT provides Directory Management - with or without RACF

zPRO's Structure – Simple!

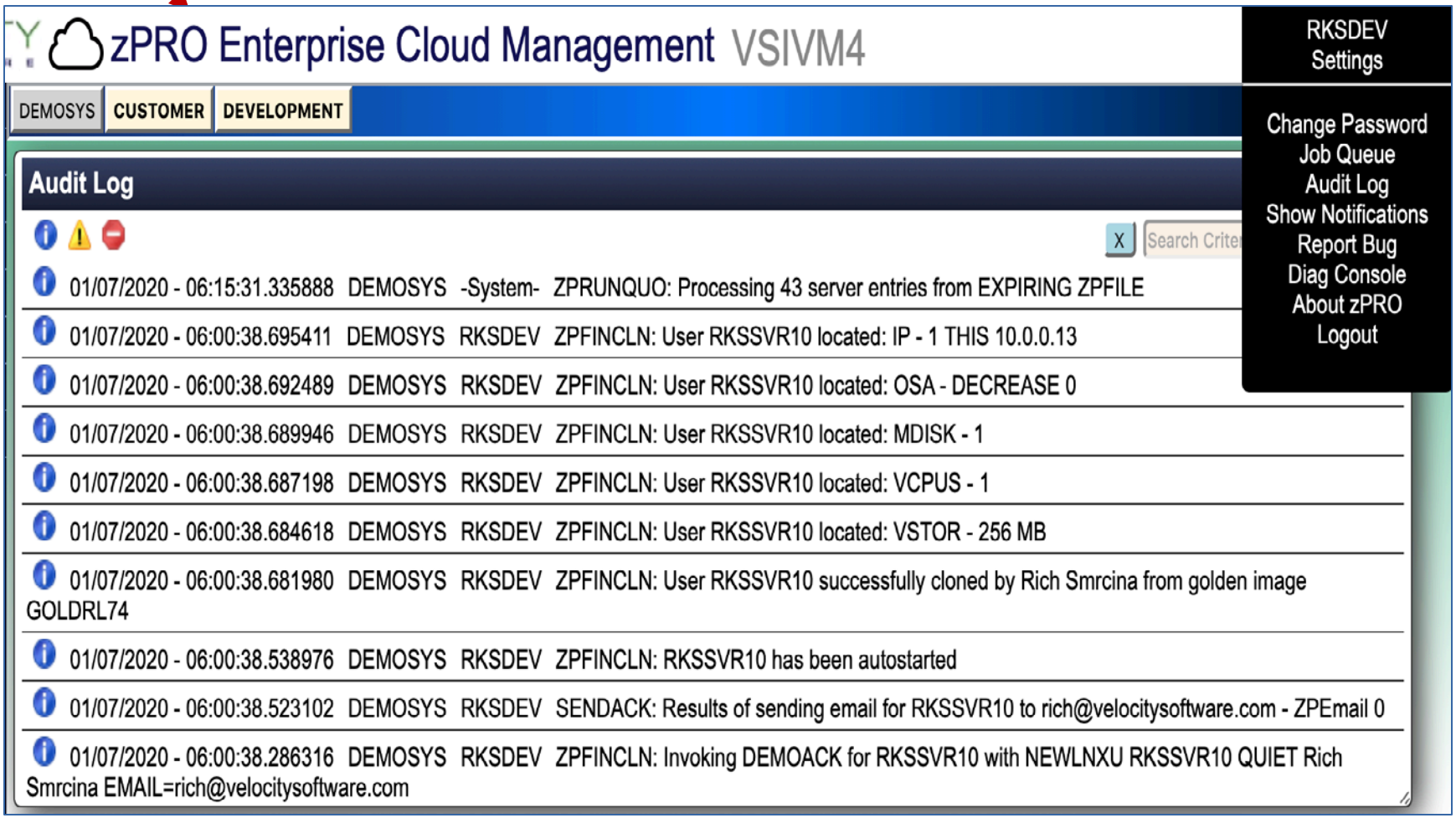




zDIRECT

- Updates directory
- Non-intrusive
- Multi-user
- No "oops"

Auditing


zPRO Enterprise Cloud Management VSIVM4
RKSDEV
Settings
DEMOSYS
CUSTOMER
DEVELOPMENT
Change Password
Job Queue
Audit Log
Show Notifications
Report Bug
Diag Console
About zPRO
Logout
Audit Log
X
Search Crite
01/07/2020 - 06:15:31.335888 DEMOSYS -System- ZPRUNQUO: Processing 43 server entries from EXPIRING ZPFILE
01/07/2020 - 06:00:38.695411 DEMOSYS RKSDEV ZPFINCLN: User RKSSVR10 located: IP - 1 THIS 10.0.0.13
01/07/2020 - 06:00:38.692489 DEMOSYS RKSDEV ZPFINCLN: User RKSSVR10 located: OSA - DECREASE 0
01/07/2020 - 06:00:38.689946 DEMOSYS RKSDEV ZPFINCLN: User RKSSVR10 located: MDISK - 1
01/07/2020 - 06:00:38.687198 DEMOSYS RKSDEV ZPFINCLN: User RKSSVR10 located: VCPUS - 1
01/07/2020 - 06:00:38.684618 DEMOSYS RKSDEV ZPFINCLN: User RKSSVR10 located: VSTOR - 256 MB
01/07/2020 - 06:00:38.681980 DEMOSYS RKSDEV ZPFINCLN: User RKSSVR10 successfully cloned by Rich Smrcina from golden image GOLDRL74
01/07/2020 - 06:00:38.538976 DEMOSYS RKSDEV ZPFINCLN: RKSSVR10 has been autostarted
01/07/2020 - 06:00:38.523102 DEMOSYS RKSDEV SENDACK: Results of sending email for RKSSVR10 to rich@velocitysoftware.com - ZPEmail 0
01/07/2020 - 06:00:38.286316 DEMOSYS RKSDEV ZPFINCLN: Invoking DEMOACK for RKSSVR10 with NEWLNXU RKSSVR10 QUIET Rich Smrcina EMAIL=rich@velocitysoftware.com

zPRO focus

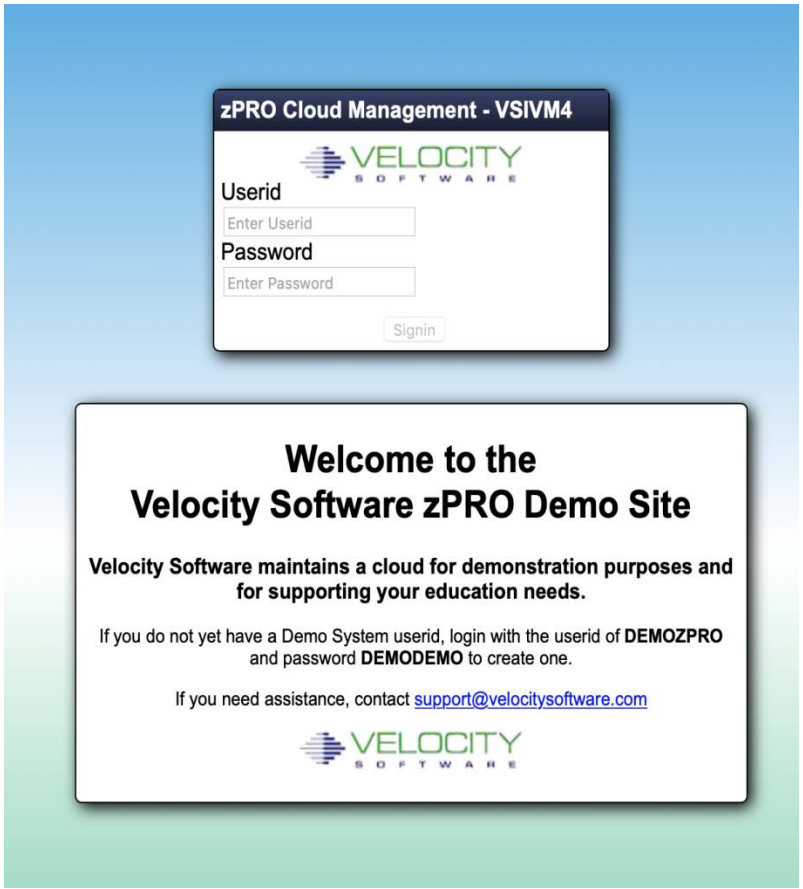
- **zPRO Focus:**
  - **Simplifying access** and acceptance of the mainframe for new, younger and possibly less skilled team members through a browser-based interface
  - Providing a **On-Prem cloud-based** facility for mainframe **training**, especially around cloud and guest management (supports Linux, CMS, z/VSE)
  - Simplifying daily tasks by **empowering** end-users to manage their own guests while *you* still control authorities and resources (Functional Decentralization)
  - Simplifying z/VM systems management for Systems Programmers

Velocity's zPRO Cloud Demo Site

- **To register: https://demo.velocitysoftware.com/zpro/**
  - Userid: **demozpro**
  - Password: **demodemo**
- **Check your email for your login info**

Our Cloud Demo site will allow you to register for your own userid. You can then use that userid to create, manipulate and use a selection of servers through zPRO.

It is a full zPRO system that is running the same code we ship to our customers. **Note** that Demo userids only have access to a subset of zPRO functions and are limited in authorizations.



Summary

Cloud on z with zPRO is VERY easy

- Native web server (zVWS)
- Easy interface
- Very reliable

zPRO Installs in minutes

Tailoring:

- Choose directory manager (DirMaint, VM:Secure, zDIRECT)
- Assign existing servers
- Define IP addresses
- Define disk pool
- Define users, groups