The Supreme Court of Virginia Linux and System z – Bringing the Future to Justice



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2014 VM Workshop

Disclaimer

 The information and opinions found herein are for informational purposes only and not necessarily those of the Office of the Executive Secretary or the Supreme Court of Virginia and should not be considered an endorsement.





Agenda -

- Quick Overview of the Supreme Court of Virginia
- How we got to where we are today
- Where the OES is going in the future

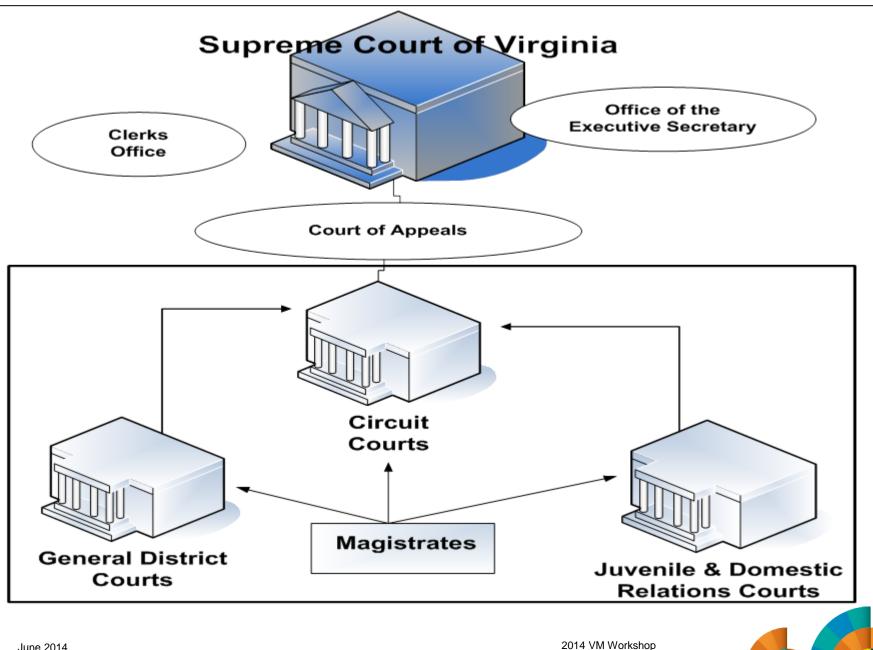


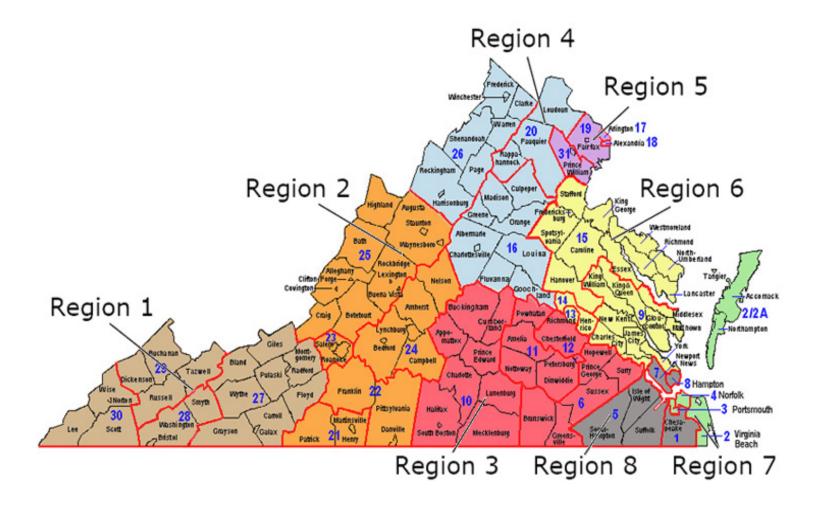
Mission Statement -

"The Department of Judicial Information Technology's mission is to support Virginia's Judiciary by providing and maintaining reliable, effective, innovative and timely technology for the courts' business processes."











The 'Supporting' Cast

- 2 zVM/zVSE System Engineers
 - 3 Database Administrators
- 1 Production Control Specialist
- 2 Linux Systems Administrators
 - 8 Cobol Developers (fte)
 - 35+ Java Developers (contract)
 - 9 Operations (fte)



Case Management System (CMS)

 Supports 325 Courts with over 5000 internal and 3,500 external users (3 Circuit courts are currently not using our CMS system)

2013 included 3.6 Million New Cases and 3.3 Million New Hearings

- Circuit main application is driven by WebSphere (java)
 Forms & Batch support still maintained in zVSE/CICS (Cobol)
- **J&DR** WebSphere (8.5) application. Batch is supported by zVSE/CICS
- General District running traditional zVSE/CICS application (currently in Java rewrite)
 Financial Management System (FMS) running in CICS
- Supreme Court running traditional zVSE/CICS application
- Court of Appeals recently converted to WebSphere



Other Applications supporting Case Management

- Records Management System (RMS) Unix application
- Case Imaging System (CIS) Unix application
- eMagistrate System (eMag)* 125 Offices/240 workstations
- *2007 ComputerWorld Honors Program Laureate

The eMagistrate System was our first venture (2004) into Linux under VM (2004). It is now a fully integrated WebSphere application complete with Video conferencing, State Police and other agency interfaces.

- Video Docketing Application (across all CMS apps)
- Conference Registration Application
- eLeave Application
- eFiling (VJEFS- Virginia Judicial Electronic Filing System)
 - Winner of the Governor's 2013 Commonwealth Technology Award
- eCollections (VJCS Virginia Judicial Collections System)



Current Systems Environment

Courts Processor

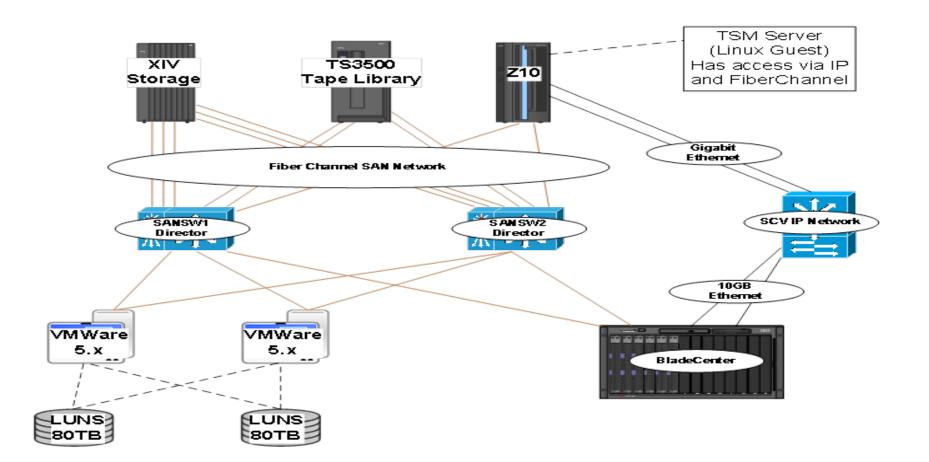
- zBC12 2828(M02)
- 2 CPs & 8 IFLs
- 2 z/VM 6.3 LPARS
- 240 GB memory
- 8 z/VSE 4.3 guests
- 2 z/VSE 5.2 guests
- 76 Linux guests
 - SLES 10 SP2
 - SLES 11 SP2
 - WAS 6.1 (31-bit)
 - WAS 7.x (64-bit)
 - WAS 8.5.1 (64-bit)
 - DB2 8.2 & 9.5
 - Oracle 11G-r2

CJIS Processor

- zBC12 2828(M01)
- 1 CP & 8 IFLs
- 2 z/VM 6.3 LPARS
- 240 GB memory
- 4 z/VSE 4.3 guests
- 80 Linux guests
 - SLES 10 SP2
 - SLES 11 SP2
 - WAS 6.1 (31-bit)
 - WAS 7.x (64-bit)
 - WAS 8.5.1 (64-bit)
 - DB2 8.2 & 9.5
 - Oracle 11G-r2



Storage Network Architecture





OEM Applications

- Barnard Software, Inc. (TCP/IP)
- Velocity Software, Inc. (Performance Monitoring)
 - CSI International, Inc. (EPIC Tape)
- Computer Associates, Inc. (Hidro, TPX and EzTrieve)
 - MacKinney Systems, Inc. (ListCat Plus)
 - ASG Software Solutions (ZEKE Job Scheduler)
 - DBI Software Inc (DB2 Performance Analyzer)



Public Online Services www.courts.state.va.us

- Internet access to District and Circuit Court records averages 373,000 searches per day
- Access to all standard Public-use Court forms for print (pdf) and submission
- Online payment of traffic and criminal offenses (currently District courts only)

Fiscal Year 2013 (ending June 2013) – 538,421 payments received totaling \$80,010,874.76

This represents 44% of payments received for all General District courts

Circuit case post pay scheduled to come on line sometime July-Sept 2014



z/Linux - What Started it All

- Magistrate system was a PC-based standalone system deployed in 200+ locations (2003)
- Sneaker-net automation
- Limited information with no statewide availability
- Massive effort to incorporate statewide system updates, especially when laws impacting system went into effect.
- Brought on IBM contract services for needs review and recommendations.
 - Write the application in a current, serviceable language (suggested Java)
 - Use WebSphere Application server as apache/application base
 - Intel or Windows
 - (I later suggested Linux on the mainframe)
 - Use DB2 for the data repository



The Process

- Contractors brought in to write the application. Development environment consisted of pc's using RAD Developer and Intel servers running WebSphere and DB2
- Application worked out, but the cost of moving forward became a major discussion.

While they chatted.....

- Built a Linux guest on the existing 9672-rb6 (no IFL)
- Decided on SUSE/Linux (SLES 8)
 - quicker 'out of the box' deployment. Seemed better equipped to address mainframe
 - WebSphere 5.1 certified on SLES8
 - Novell support available (State contract)



The Decision

Linux on the Mainframe

- Leveraging experience and knowledge of existing staff
 - 25 years experience in IBM mainframe and hypervisor technologies
- Scalability of the VM, Linux and the zSeries platforms
- Stability of mainframe hardware and operating systems
- Cost savings in licensing
 - The control process mandated multiple servers to support development testing, demo/training and production
 - Licensing costs for one IFL equaled that of one Intel processor
 - Needing 6-8 Intel servers would increase costs 6-8 times over what the Linux/IFL solution provided.
 - The admin and maintenance efforts to support the mainframe systems were estimated to be much less than the same efforts for multiple Intel boxes



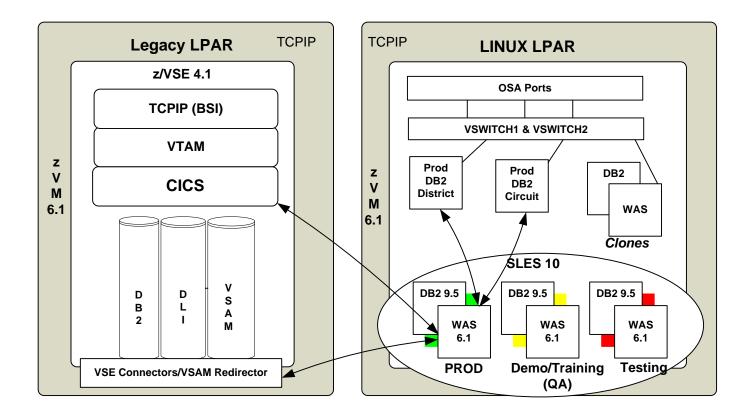
Initial Challenges

- Intel processes ran much (as in way) faster than the same workload on the 9672

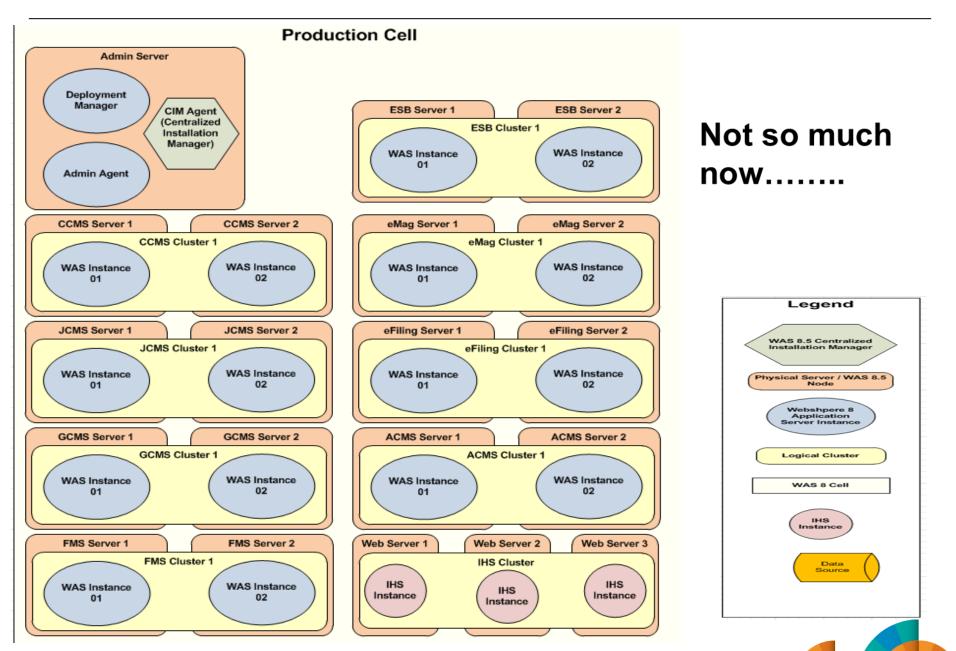
 Memory leaks in the SUSE 5.1 (mainframe) source did not help
- Continued battle between 'mine runs faster' vs 'mine runs cheaper'
- Managed to get approval to upgrade the 9672 to z890 with 1 IFL
 - Upgraded WebSphere to 6.1
 - Upgraded to VM 6.1
- Better throughput speeds, still a bit slower, but still extremely more cost effective in both hard and soft dollars.

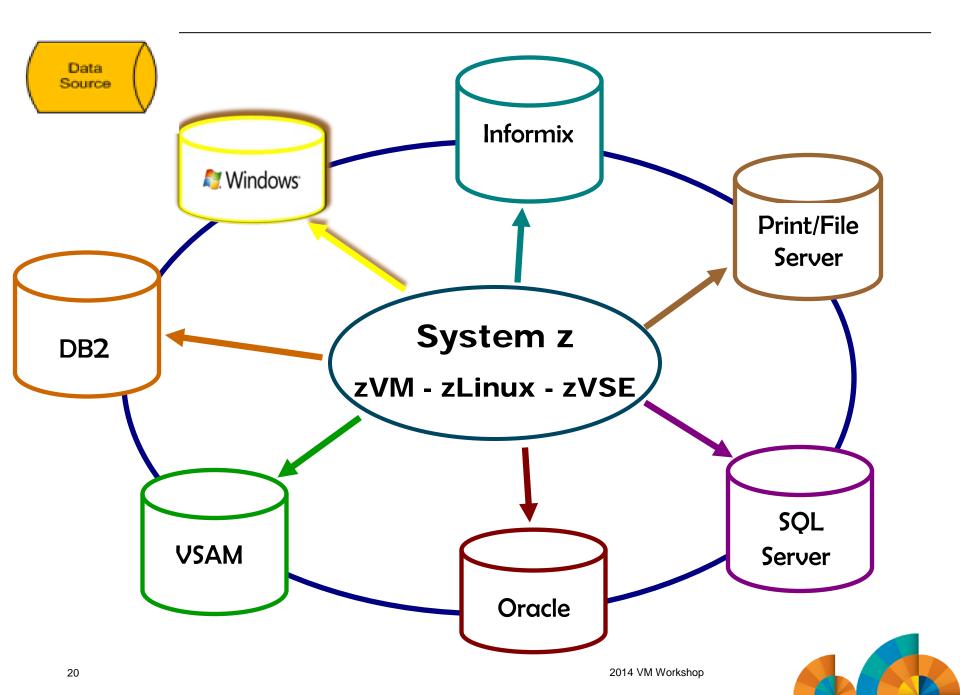


Simple in the beginning.....









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To this.....

Circuit Case Management System

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Primary CCMS Window



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Challenges then, now and beyond.....

- Various versions of WebSphere, DB2, z/VM, z/Linux, zVSE etc etc.
- Maintaining consistencies with base code, updates and patches (internal and external)
- Supporting several single node and complex clusters through project lifecycles
- User demand for more complex application integration (like eFiling)
- Continued requests to multiply, thrive, flourish, boom, increase, bloom, burgeon, grow, mushroom......
- zVM/zVSE environment support structure is sound......

How are we handling the continuing Linux Proliferation challenge?



Application Challenges

- Legislative changes required
- Political climate
- Interfaces with other applications and agencies
- Payment processing (existing and future opportunities)
- Response time for requests to update environments (including desktop apps)
- Development silos
- Legacy-centric full-time staff versus contract java developers
- Responding to User change requests (enhancements, defects, BYOD, Data access, etc)



System Platform Challenges

- Hardware limits versus growth (and cost)
- Maintaining expertise i.e. Linux admins, VM/VSE System Programmers, application programmers, etc.
- Developing expertise in project management (Top down)
- Continuity between platforms and environments especially during hardware or software migrations
- Full regression testing requirements to support browser layers
- We continue to work on organized planning and communication.....





Planning and Coordination Disciplines



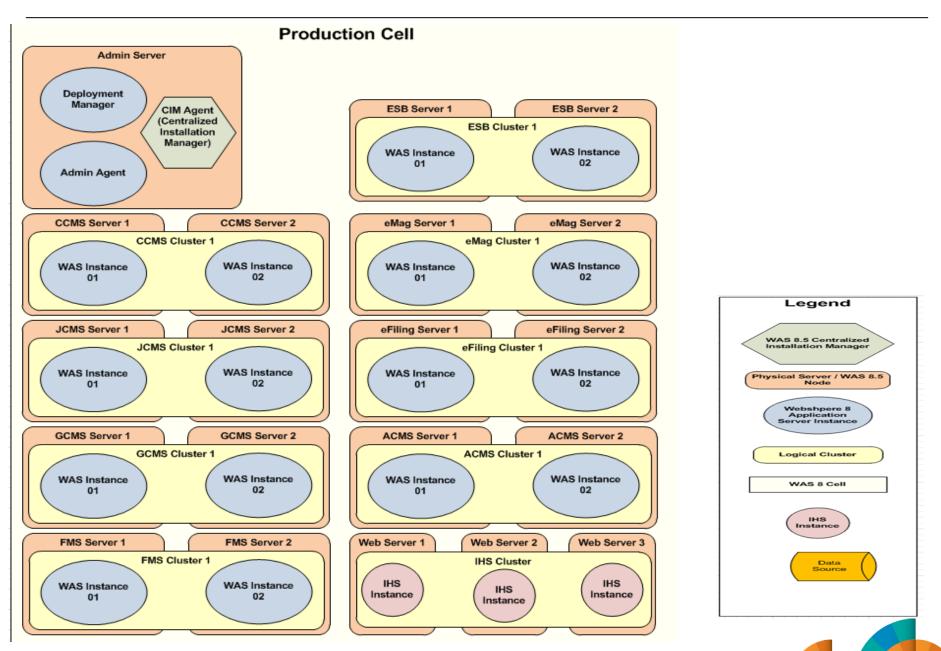


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Doing more with less.....

- Certified 'clones' for ND, Application and Apache(web) servers *'if you always do what you always did, you will always get what you always got....'*
- Utilize jython scripting for standard customization of clusters, datasets and WebSphere settings
- TADDM assists with change awareness and documentation
- Solid backup and recovery infrastructure using Hidro and TSM
- Building on Project Management Office (PMO)
- Rational Software Architect for WebSphere
- Rational Application Developer
 - Utilizing TortoiseSVN as a code repository
- Maximizing benefit from Performance Monitor (Velocity)
- Leverage JXBrowser technology to eliminate redundant browser compatibility issues





WebSphere Application Server Network Deployment

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± Jobs			FormsEAR3.2.1.1	€			
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WebSphere Application Clusters -

WebSphere application server clusters

WebSphere application server clusters

Use this page to change the configuration settings for a cluster. A server cluster consists of a group of application routed to other members of the cluster. Learn more about this task in a <u>guided activity</u>. A guided activity provides topic.

🗄 Preferences

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WebSphere Application Servers -

Flexibility in controlling nodes, run weights, start up priorities etc

pplicatio	n servers							
Use th applica	Application servers Use this page to view a list of the application servers in your environment and the status of each of these servers. You can also use this page to change the status application server. Preferences							
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	pasalogServer01	pasalog1Node01	pasalog1	ND 8.5.0.0	pasalogCluster01	€		
	pasalogServer02	pasalog2Node01	pasalog2	ND 8.5.0.0	pasalogCluster01	0		
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Tivoli Application Dependency Discovery Manager (TADDM)

6 172.19.182.11 - Tivoli Application D	Dependency Discovery Manager - Wi	ndows Internet Explorer				
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TADDM - WebSphere Component Comparison

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TADDM – Discover run against the security.xml file from one WebSphere App Server to another...

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	wasNode01Cell:iqwscc2.courts.state.va.us:admin_host:172.19.82.22:9043	[Not Set]					
	2809:admin_host:172.19.82.24:9043	2809:admin_host:172.19.					
Custom Query	Label	wasNodeD1Cell:iqwscc1.					
	Config Contents						
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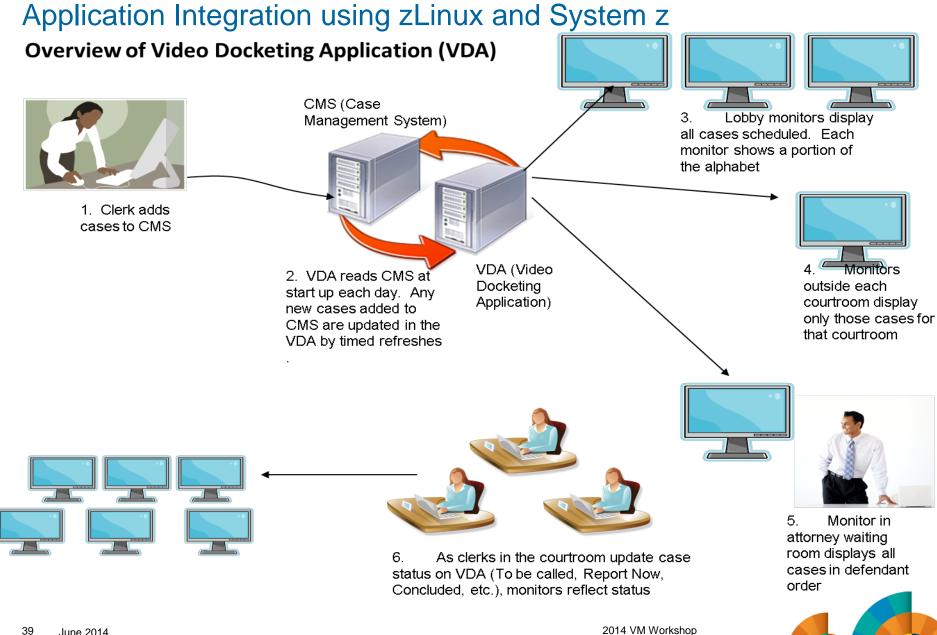


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Applications running in Linux on System z play very nice with others.....

Some examples of current System z applications running in concert with other environments.....

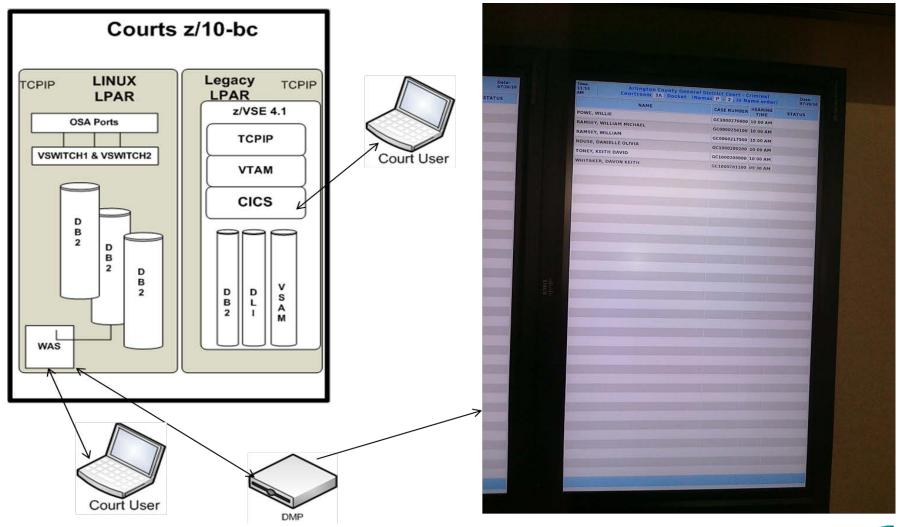




Video Docketing Application –



Video Docket -





Judicial Conference Online Registration System

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	*Last Name	*Badge Name	There a li						
			Email	Phone		Title			
					XXX-XXX-XXXX				
*Hotel Details									
 I do not need a room reservation. I have made/will make my room reservation for 1 room(s). Reminder: You need to make your own hotel reservations. Please note that a credit card will be required. Room Preferences: Cavalier on the Hill Cavalier on the Ocean 									
Cavaller on the rill O				hat are received, we will	conduct training on Su	inday afternoon and possibly			
computer Training Classes Dince again, computer training will I uesday afternoon. If you would lik									
omputer Training Classes	ke to participate, p	please select the two co							
computer Training Classes Once again, computer training will livesday afternoon. If you would like conference.	ke to participate, p otus Notes System	please select the two co n)							
omputer Training Classes Once again, computer training will l uesday afternoon. If you would lik onference. Basic E-Mail (Supreme Court Lo	ke to participate, p otus Notes System urt Lotus Notes Sys	please select the two co n) stem)							
omputer Training Classes Once again, computer training will l uesday afternoon. If you would lik onference. Basic E-Mail (Supreme Court Lo Advanced E-Mail (Supreme Cou	ke to participate, p otus Notes System urt Lotus Notes Sys	please select the two co n) stem)							

WebSphere application (System z) accessing Oracle database (running on HP) with interaction with Active Directory running in a Windows Server environment

Conference Management Console

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June 2014

Conference Name	Description	Message If needed to be Stopped	Manage
TEST - Judicial Conference of Virginia	Course : CCTST Session # : 0001 Status : started Start Date : March 01, 2008 End Date : March 01, 2011	This is a Test Conference It would not be available in production.	 Refresh Data Edit Conference Delete Conference Stop Conference
Virginia Circuit Court Clerks Conference	Course : CCLKCF Session # : 0001 Status : started Start Date : June 08, 2009 End Date : June 09, 2009	Put a message if you want to stop/pause the conference	 Refresh Data Edit Conference Delete Conference Stop Conference
Judicial Conference of Virginia	Course : CCJMCF Session # : 0002 Status : started Start Date : May 11, 2009 End Date [No Title].3, 2009	Put a message if you want to stop/pause the conference	 <u>Refresh Data</u> <u>Edit Conference</u> <u>Delete Conference</u> <u>Stop Conference</u>
District Judges Voluntary Conference Location	Course : DCJVCF Session # : 0002 Status : started Start Date : April 21, 2010 End Date :	Put a message if you want to stop/pause the conference	 <u>Refresh Data</u> <u>Edit Conference</u> <u>Delete Conference</u> <u>Stop Conference</u>

Human Resources eLeave Application

Human Resources					
We	lcome	e OESINET For	ms User's Guide Quick Reference FAQs Logout		
	Roles Leave Approval Mass Leave Entry & Approval Ba Approved Leave - Deletions				
		View Selected	Description		
	₽	Supervising Authority	 For employees that report to you: Approve/Deny leave Inquire on summary balances and detailed leave transactions Enter and approve mass leave entries Update leave entries that have been submitted for approval View Calendar 		
		<u>Employee</u>	 Inquire on summary balances and detailed leave transactions Enter leave Submit leave for approval Update leave entries that have not been submitted for approval 		



What's Next?

- Continue to exploit WebSphere 8.5 in clustering environment\
- Migrate DB2 databases to latest supported version (10.x)
- Complete zVSE 5.2 migration
- Continue the eFiling implementation with added feature and functionality
- Bring General District and Financial applications online for user checkout and eventual production deployment
- Expand use of Message Broker/ Service Bus
 - Expand BYOD services for all application stacks
 - Rebuild portal services for internal and service unit integrations
- Continue to learn and share from peers (like you!) in an effort to provide the Commonwealth
 of Virginia the best possible Judicial system available



In conclusion

- Maximize the application products purchased
- Maximize the support offered by your software maintenance arrangements
- Take advantage of the social environments i.e. listservs, linkedin groups etc
- Develop and enforce standards relative to provisioning, change control, implementation etc.
- Don't be afraid to try.....



Questions, comments, suggestions.....complaints ?????





Thank you for allowing me to share the SCV's successful exploits of z/VM, z/Linux and z/VSE



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