

Running a Successful Proof of Concept for Linux on z Systems

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Agenda

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IT Infrastructure

Services

- Why POCs for Linux on z Systems
- The Value of the z13 Platform
- Do's and Don'ts on Linux Proof Of Concepts

Why?

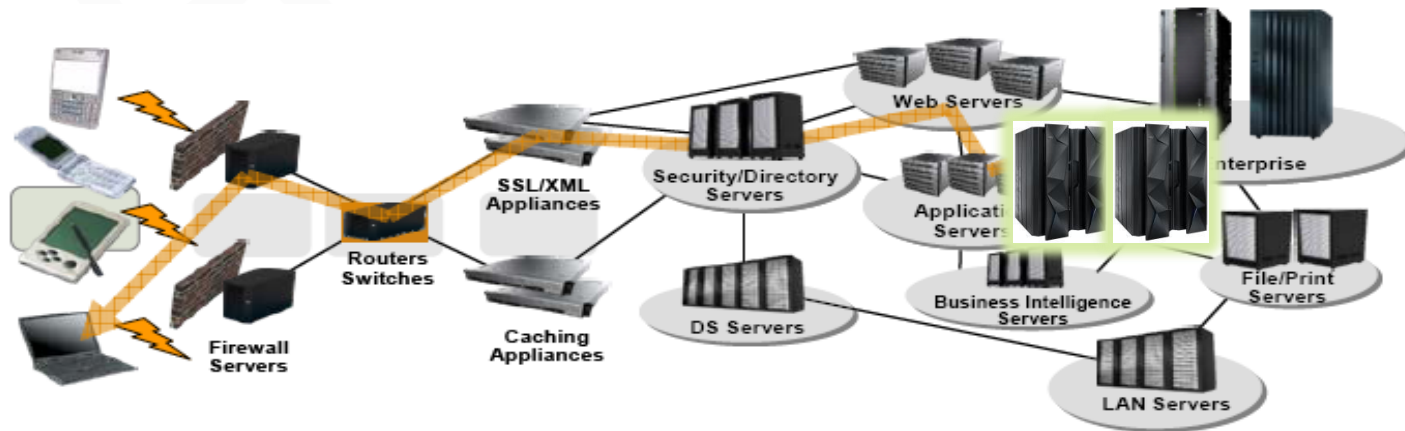
- Proof of Concepts for Linux on z Systems
 - Reduce Infrastructure complexity
 - Cost savings
 - High Availability / Disaster Recovery / Security
 - Application Development

Complexity in the Current Environment

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- How many x86/UNIX servers are deployed every month?
- How much data center space is available, or will it become a problem?
- Is energy consumption growing?
- How many additional people are required to maintain the constantly growing number of servers?
- How will software license costs grow, including virtualization software?
- How can IT availability be ensured? What happens in the case of a disaster?

The disadvantages of this model are beginning to outweigh the advantages

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Advantages

- Has traditionally been cheap, fast and easy to add more servers
- To date, it's been "good enough" ...
- Is this why x86 infrastructure are moving to the cloud???



Disadvantages

- Today's workloads require the fastest response times
 - Physical networking introduces too much latency, especially for massive, dispersed workload
- Software license costs are becoming unsustainable
- Labor intensive (management, provisioning, deployment, etc.)
- Datacenter environmental requirements continue to grow – power, space and cooling
- In general, operational expenses are getting out of hand

How Sizings Effects the TCO?

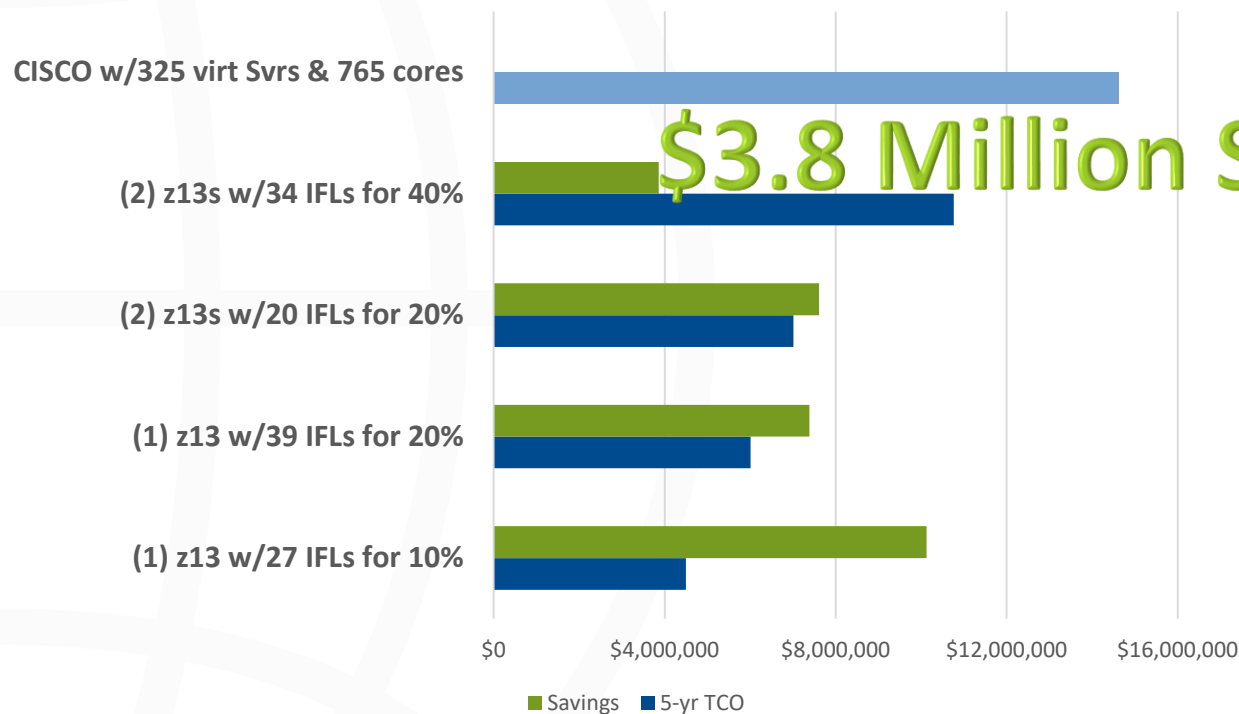
Comparative 5-Year Costs Between IBM System z 13 and Distributed CISCO Servers

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z13 Emperor vs CISCO for WebSphere Comparison



\$3.8 Million Savings

Cisco

- 43 physical servers
- 325 WebSphere virtual servers
 - 146 Production
 - 103 QA
 - 71 Development
 - 5 Lab
- 765 cores

Z13 LinuxONE w/SMT

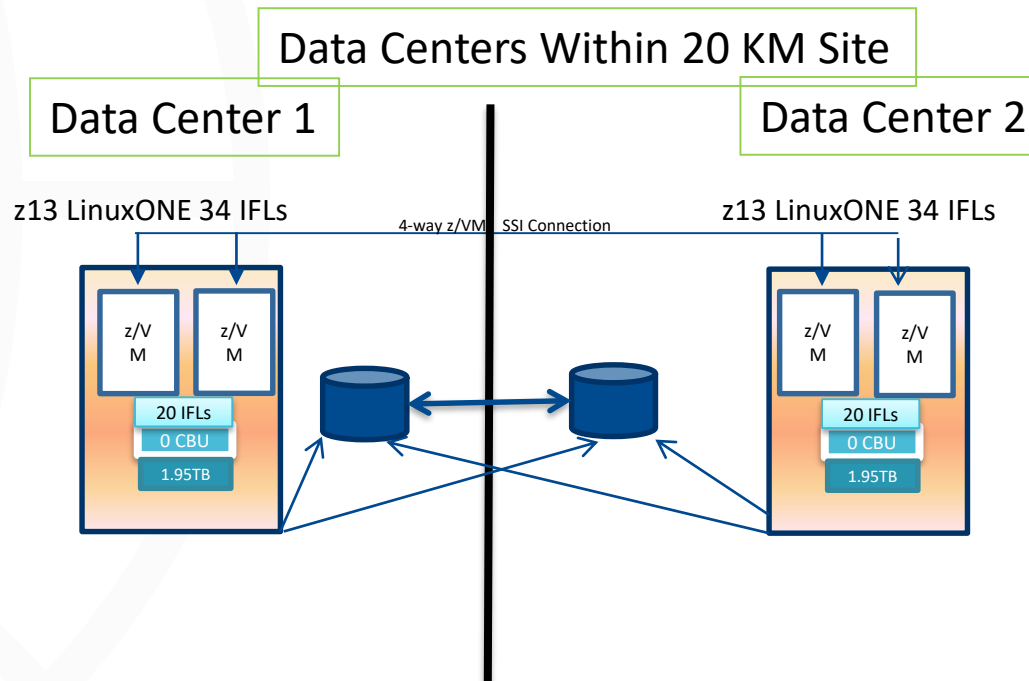
Size for concurrent peak of virt servers

- 10% concurrent peak = 33
- 20% concurrent peak = 66
- 40% concurrent peak = 132

NOTE: Customer estimated CISCO Utilization. Distributed costs do not included HW refresh and HW maintenance. Z13 sizing assumes SMT 20% boost.

WebSphere Cluster and SUSE High Availability

- SUSE High Availability Extensions assumes access to same disk array (40ms heartbeat)



Hardware Improvements

VALUE OF THE Z13 PLATFORM

The Value Statement

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- The world's fastest and most scalable system **IBM z13**
 - **Processing roughly 100 Cyber Mondays every day.**
- Ideal for large scale data and transaction serving and mission critical applications
- Most efficient platform for Large-scale Linux® consolidation
- Capable of massive scale up, over 111 Billion Instructions per Second (BIPS) 5.0GHz processors
- SMT and SIMD on each core
- PR/SM on z13 is designed for EAL5+ security certification

Large Virtualization

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- Why virtualize?
 - Oracle supports zVM virtualization environment
 - Greater RAS on System z, i.e. MTF 40+ years
 - Increase productivity through virtualization
 - Higher utilization of resources, i.e. 90% CPU
 - Reduced power, cooling and floor space

IBM LinuxONE Rockhopper TM



IBM LinuxONE Emperor TM



<p>Positioning</p>	<p>An entry point into the LinuxONE Systems family offering all the same great capabilities, innovation and value of LinuxONE with the flexibility of a smaller package</p>	<p>The ultimate flexibility, scalability, performance and trust for business critical Linux applications. With a huge capacity range you can grow with virtually limitless scale to handles the most demanding workloads in a single system</p>
<p>Hardware</p>	<p>Better environmentals, lowest cost, less memory, fewer cores, SMT, zAware</p>	<p>SMT, large memory, more cores, more I/O, enhanced crypto performance, more Logical Partitions, zAware</p>
<p>Cores</p>	<p>2 to 20 LinuxONE Cores Up to 4 TB</p>	<p>6 to 141 LinuxONE Cores Up to 10 TB</p>
<p>Hypervisor</p>	<p>z/VM and/or KVM for IBM z</p>	

Recommended Workloads for Linux on System z

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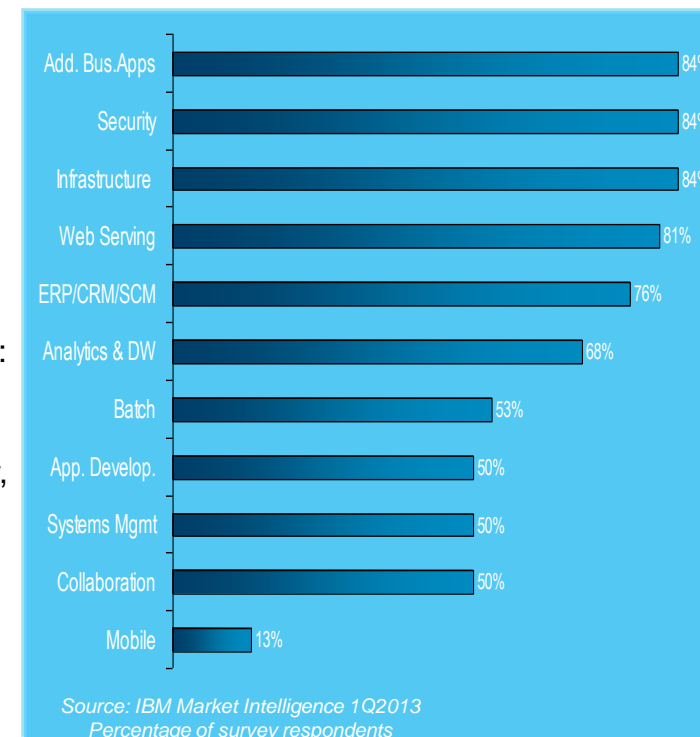
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- ✓ **Data services:** DB2, Cognos, SPSS, InfoSphere™, Informix, Oracle Database, IBI WebFOCUS, ...
- ✓ **Business applications:** WebSphere Application Server, WebSphere Process Server, Java™, ...
- ✓ **Mobile application hosting:** WebSphere Portal, IBM Worklight®, ...
- ✓ **Security & Infrastructure services:** WebSphere MQ, WebSphere Message Broker, WebSphere Enterprise Service Bus, DB2 Connect™, ...
- ✓ **Email & collaboration:** IBM Domino®, IBM Collaboration Solutions: Sametime, Connections, Forms, ...
- ✓ **Business Process Management:** Business Process Manager, WebSphere Business Monitor, FileNet® Business Process Manager, WebSphere Operational Decision Management, ...
- ✓ **Enterprise Content Management:** FileNet Content Manager, Content Manager, Content Manager On Demand
- ✓ **Development & test:** e.g. of WebSphere/Java applications – Rational® Asset Manager, Build Forge®, ClearCase®, Quality Manager, UrbanCode
- ✓ **Industry Solutions:** Intelligent Operations Center for Smarter Cities®, Smarter Infrastructure for Social Services - Curam on zEnterprise, Enterprise Asset Management (Maximo®) for Government, Smarter Analytics™ Anti-Fraud Infrastructure for zEnterprise, zEnterprise Smarter Analytics for Retail

➔ **All workloads managed in a Cloud:** Tivoli® Provisioning Manager (TPM), Tivoli System Automation Manager (TSAM), SmartCloud Provisioning (SCP), IBM Wave for zVM, xCat, ...

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DO'S AND DON'T ON LINUX PROOF OF CONCEPTS

Managing the Linux POC

Planning

Project Initiation

Value Proposition

- Learning the value of System z Linux
- Server Consolidation Sizings
- Business Case Development

POC Initiative

- Scoping POC
- POC IFL Sizings
- Real memory sizing
- Scope Document

Project Definition

Infrastructure Planning

- Hardware
- Software
- Network
- Security
- Disk
- Backup & Recovery

Project Planning

- Scope Document
- Project Plan
- Team Roster
- Systems Assurance
- SOW Consulting Svc
- Status Report
- Phone Support

IBM Loaner Program

- POR date
- Success Criteria
- Configs
- Sizings
- IBM Contracts
- Linux Trial
- Software Trial

Installation & Set Up

- IBM loaner Eq.
- zVM & Linux install
- Other SW install
- Network
- Security
- Disk
- DB loads
- Application set up
- Other Distributed Servers
- Weekly Status Meeting
- Status Report

Testing

- Test Plan
 - Unit
 - Volume/Performance
- Weekly Status Mtg
- Status Report
- Issues Management
- Escalation Process
- Resource Management
 - In house
 - Mainline
 - IBM
 - Linux vendor
 - ISVs

Closing

- POC Final Report
- Success Criteria Acceptance
- IFL Purchased or removed



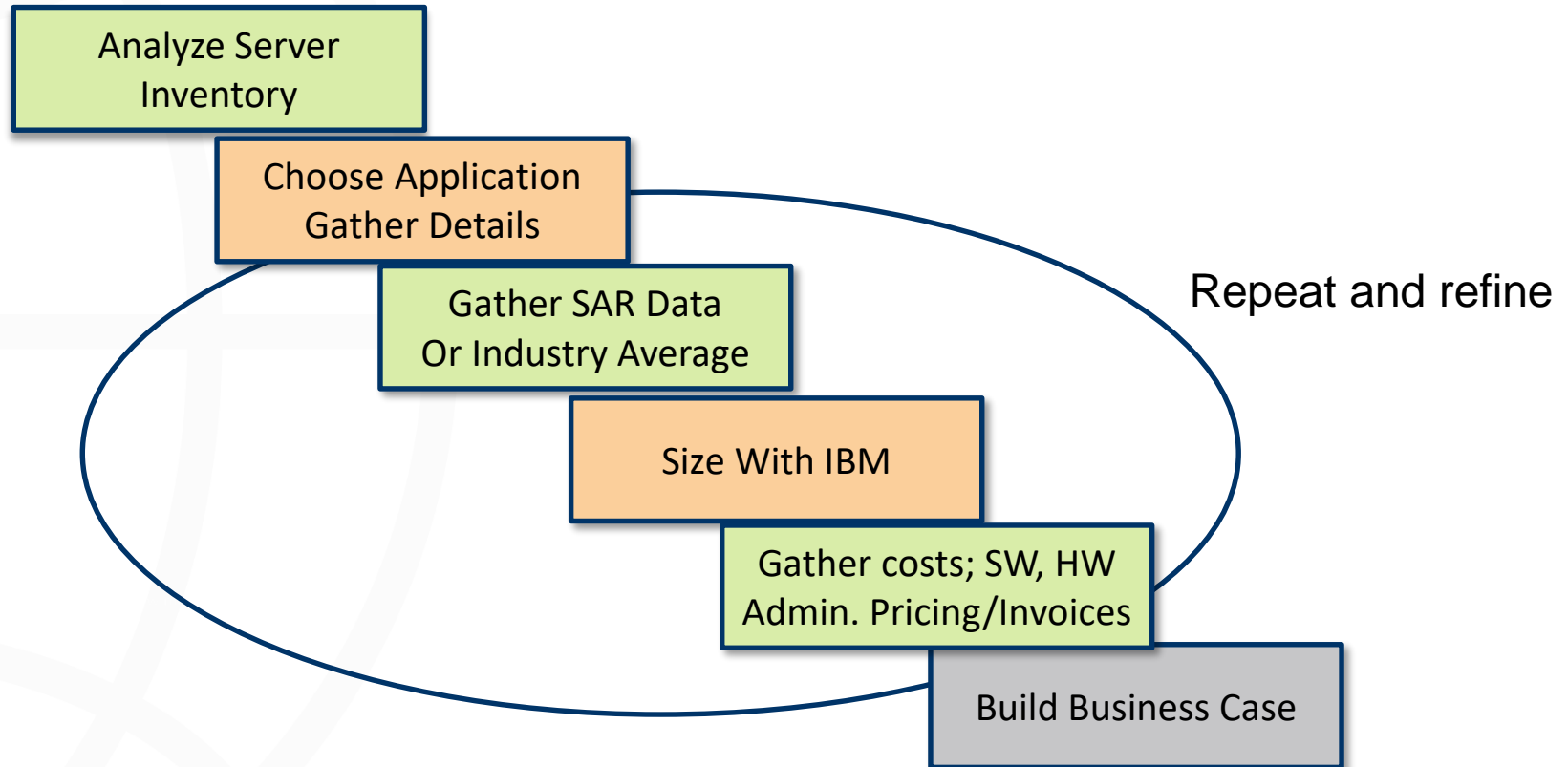
- Production Implementation Planning
- Purchasing
- Technical Services
- Vendor 24x7 Support

Steps To Build the Business Case

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Mainline Information Systems System z Linux Business Case Methodology

2016

TCO: A Range of IT Cost Factors – Often Not Considered

- **Availability**
 - High availability
 - Hours of operation
- **Backup / Restore / Site Recovery**
 - Backup
 - Disaster Scenario
 - Restore
 - Effort for Complete Site Recovery
 - SAN effort
- **Infrastructure Cost**
 - Space
 - Power
 - Network Infrastructure
 - Storage Infrastructure
 - Initial Hardware Costs
 - Software Costs
 - Maintenance Costs
- **Additional development/implementation**
 - Investment for one platform – reproduction for others
- **Controlling and Accounting**
 - Analyzing the systems
 - Cost
- **Operations Effort**
 - Monitoring, Operating
 - Problem Determination
 - Server Management Tools
 - Integrated Server Management – Enterprise Wide
- **Security**
 - Authentication / Authorization
 - User Administration
 - Data Security
 - Server and OS Security
 - RACF vs. other solutions
- **Deployment and Support**
 - System Programming
 - Keeping consistent OS and SW Level
 - Database Effort
 - Middleware
 - SW Maintenance
 - SW Distribution (across firewall)
 - Application
 - Technology Upgrade
 - System Release change without interrupts
- **Operating Concept**
 - Development of an operating procedure
 - Feasibility of the developed procedure
 - Automation
- **Resource Utilization and Performance**
 - Mixed Workload / Batch
 - Resource Sharing
 - shared nothing vs. shared everything
 - Parallel Sysplex vs. Other Concepts
 - Response Time
 - Performance Management
 - Peak handling / scalability
- **Integration**
 - Integrated Functionality vs. Functionality to be implemented (possibly with 3rd party tools)
 - Balanced System
 - Integration of / into Standards
- **Further Availability Aspects**
 - Planned outages
 - Unplanned outages
 - Automated Take Over
 - Uninterrupted Take Over (especially for DB)
 - Workload Management across physical borders
 - Business continuity
 - Availability effects for other applications / projects
 - End User Service
 - End User Productivity
 - Virtualization
- **Skills and Resources**
 - Personnel Education
 - Availability of Resources



Routinely Assessed Cost Factors

DO'S AND DON'TS

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The Proof of Concept:

Don'ts

➤ Don't do a POC if you do not need to

Do's

- Linux on z Systems is proven technology!
 - Sell the value of Linux on z Systems
 - Show a Business Case with positive ROI
 - Design the architecture
 - Install and implement!

DO'S AND DON'TS

Sizing and Business Case:

- Do's
- Do get all the facts from the SMEs
 - Distributed hardware specifications
 - Server utilizations
 - Refresh plans
 - Software costs
 - Size with actual utilization – plan “fudge factor” as appropriate
 - Estimates for Peak vs. average utilization
 - Even at an Enterprise sizing - Pick your workloads
 - High level vs. Detail Business Cases – there is a difference!
 - Get Management and Executive Sponsorship on Business Case
 - New applications continue to be a sizing challenge – It's a best guess

Don'ts

- Choose one application for a business case

DO'S AND DON'TS

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Scope:

- Do's
 - Executive sponsorship is key
 - Agreed on success criteria by all the decision makers
 - Define a manageable project with manageable workload in a manageable period of time

- Don'ts
 - Functional vs. benchmarks – Don't do a benchmark
 - Test real workloads not fabricated scenarios
 - Don't test on CPU intensive workload
 - Don't complicate POC with additional Linux tools
 - Don't install new, untested products – unless you HAVE to
 - Beware of the learning curve
 - Include subject matter experts

DO'S AND DON'TS

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Plan:

Do's

- Team members with skin in the game
- Include the applications, DBA and Business Analysts
- Representation of all groups involved (network, systems, distributed, DBAs, applications)
- Engage the 'experts' within Business Partners and IBM
- Project team needs to be fully engaged
- Plan, Plan, Plan and work your plan

Don'ts

- Don't plan to do too much - Evaluate only required products and solutions
- Don't wait to the end to define the test cases
 - Define the test cases early on in the POC. Document and gain Executive sponsor concurrence

DO'S AND DON'TS

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Execute:

Do's

- Schedule weekly status meeting and document discussions
- You must have the right tools to monitor your system – Software trials available here too
- Resolve problems with SMEs, Business Partners and IBM

Don'ts

- Don't allow 'project sprawl'
- Don't allow a POC to last 'forever'. Resolve the delays.
- Don't make multiple changes at the same time when doing performance tuning. Document each change.
- Don't set up each Linux guest identical to the last – size it accordingly
- Don't forget to administer your new environment

Planning for production:

Do's

- Architect the production environment
- Follow an implementation plan
- Include the SMEs, Business Partners and IBM

Don'ts

- Don't upgrade application between the time of the POC and production cutover, stay with what is tested
- Don't forget about disaster recovery

Why choose Linux on z Systems?

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Why Linux on z Systems?

Financial

- ✓ Lowest overall TCO, Competitive TCA, superior QoS
- ✓ Reduced labor costs by reducing network, DBA and Security staffing Day-to-Day management
- ✓ Reduced software costs by reducing number of licenses through consolidation
- ✓ New Elastic pricing for managing cost of fluctuating capacity demands.

Availability

- ✓ Highest Availability hardware platform
 - + Mean Time to Failure is measured in decades
- ✓ CBU processors offer an agile and flexible methodology for continuous operations of distributed workloads on System z

Security

- ✓ Enterprise Assurance Level 5+ (EAL5+) certification insures that the highest levels of system assurance and security can be achieved.
- ✓ Existing cryptographic processors allow for more efficient operation of internal controls such as encryption of data

Management

- ✓ Support for vRealize to provision zVM virtual guests
- ✓ Improved workload management to ensure resources to high priority workloads

Disaster Recovery

- ✓ Implement on a System z platform where disaster recovery testing has consistently achieved successful tests
- ✓ Apply existing z/OS disaster recovery and business continuance practices to the distributed workloads

QUESTIONS????