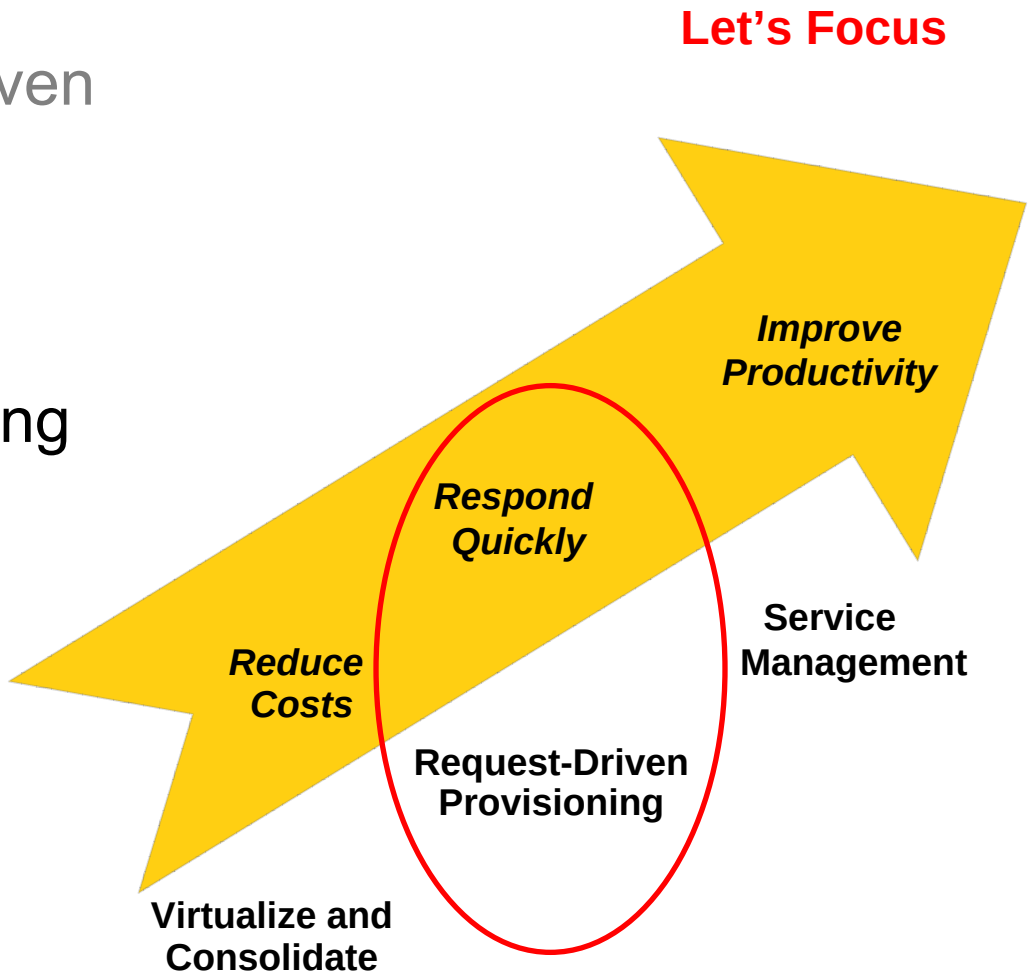
System z Enables Solutions For A Smarter Planet

Enterprise Systems Management

Dynamic Infrastructure For A Smarter Planet

- Virtualization and Consolidation is a proven way to save money

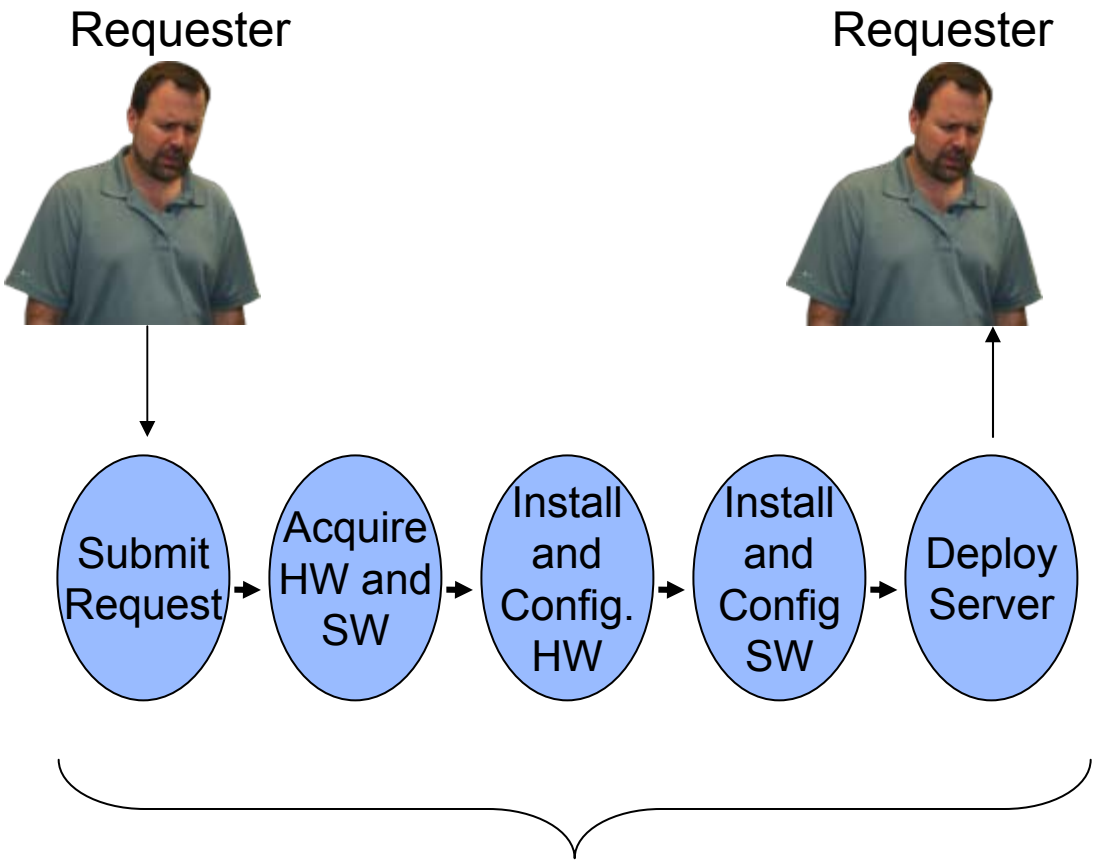
- Request Driven, or Automated, Provisioning increases agility and lowers labor costs



Deploying New Applications And Services Is Difficult And Time-Consuming

We need to be more responsive. It can take us up to **6 months** to provision a new server!

Service Oriented Finance CIO



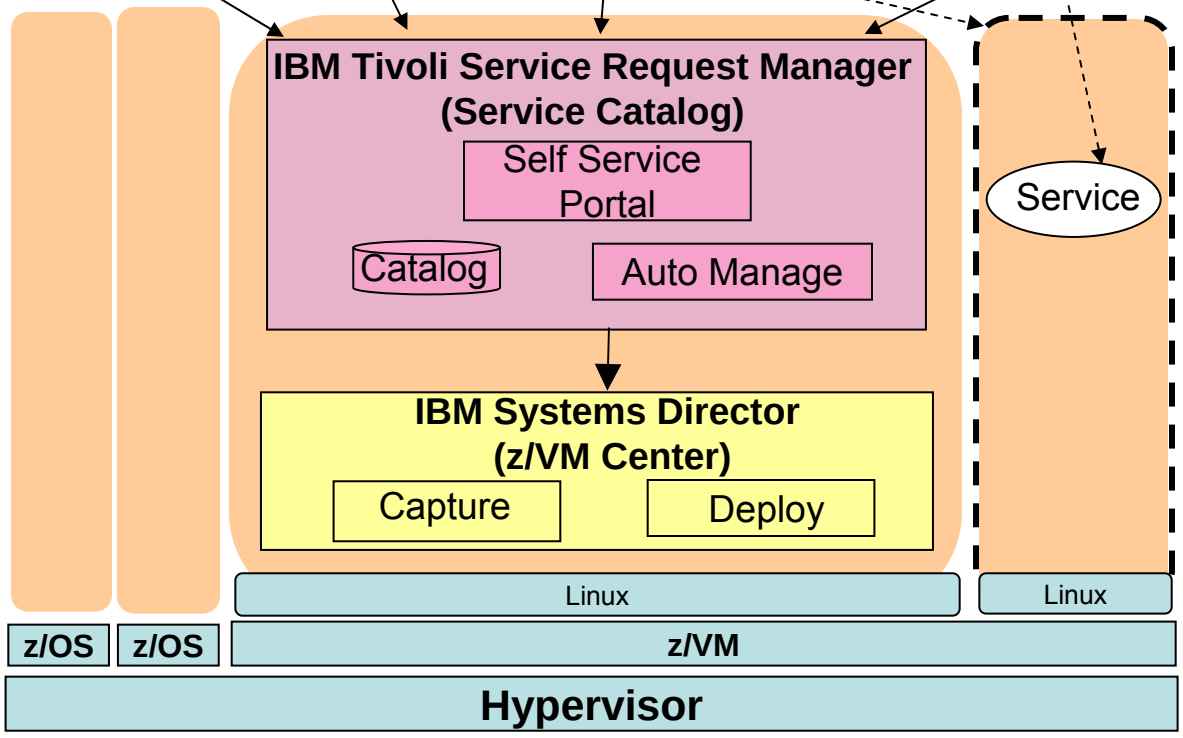
Example – User Requests New Virtual Image On System z To Test Loan Application

User browses through the service catalog, adds service to his shopping cart, submits request

Request Approved

Request Fulfilled (implemented with z/VM Center)

User gets notification of his requested service being ready



Tivoli Service Request Manager (Service Catalog)

User browses through the service catalog, adds service to his shopping cart, submits request

Request Approved

Request Fulfilled

User gets notification of his requested service being ready

Service Catalog

Self service portal and catalog

- Structured, searchable, database of services available to end users
- Add orders to shopping cart and checkout

Auto manage order approval

- Order authorization and approval

Auto manage order fulfillment

- Automated provisioning of services
- Workflow management of manual process steps

Auto manage user notification

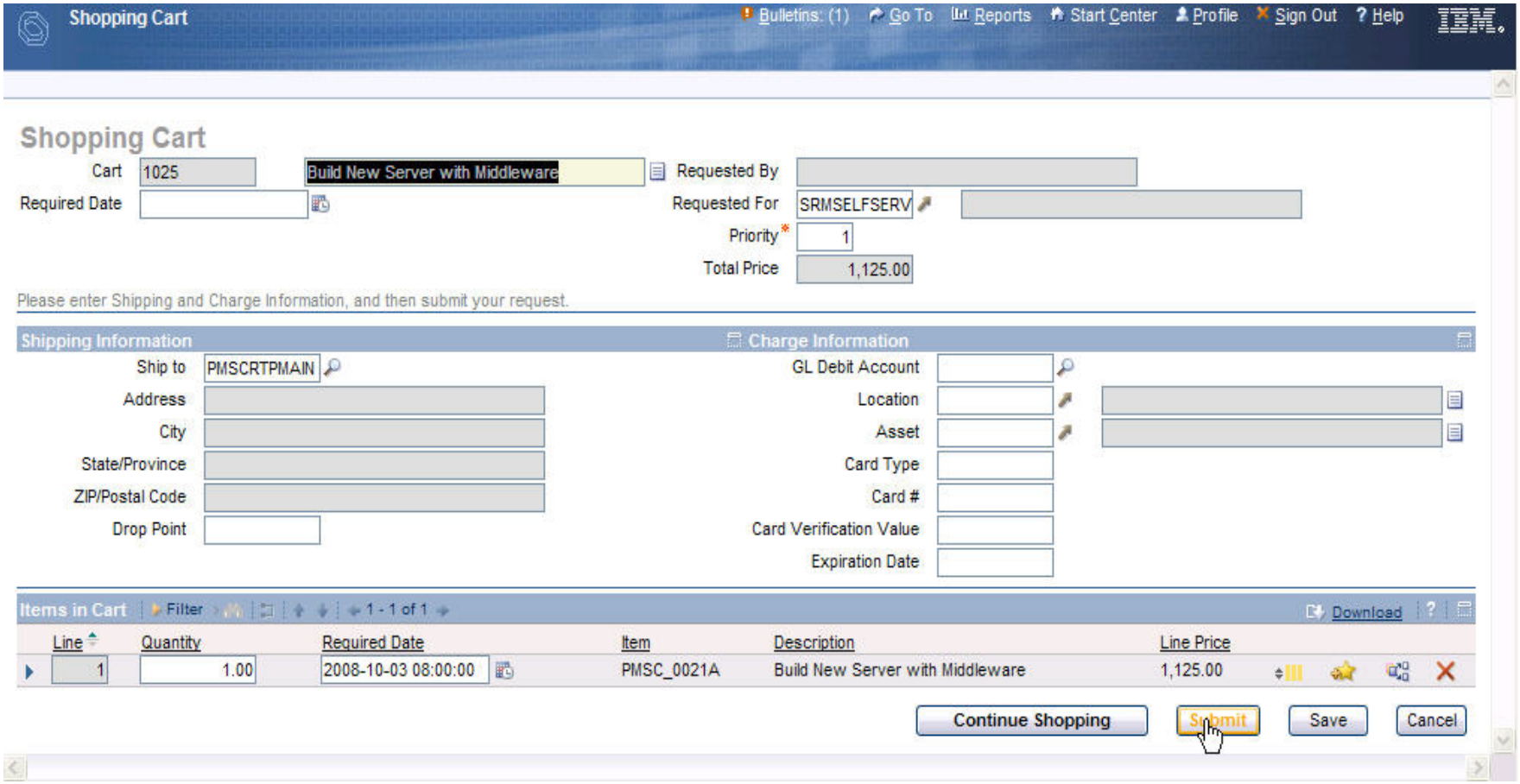
- Automatic notification to users of service being ready

Out-Of-Box Service Catalog Content

Service Line	Service Line Component	Service Definition
Server Systems Management	Server Management	Build New Standard Server Image
		Build New Standard Server Image with Middleware
		Deploy Server to Floor
		Perform Initial Build Activities
		Server Lock Down
	DB Subsystem Support	DBMS Install and Configure
		Add Database to Server
		Remove Database from Server
	Middleware Support	Middleware Install and Configure
Distributed Client Services	IMAC	Office Move
		Minor Facility Request
Enterprise Security Management	Identity and Access	Lotus Notes ID - Change Password
		Lotus Notes ID - Change User Name or Certifier
		Lotus Notes ID – Create/Delete Account
		ID Request
Data Network Services	Operations	Firewall Service Request
Fixed Cost Service Requests		Minor Site Enhancement
		I&S Network Consulting
		Bandwidth Analysis Assessment
Composite Service Examples		Build New Server
		Build New Server with Middleware

DEMO: Tivoli Service Request Manager

- User browses through Service Catalog
- Adds services to shopping cart
- Submits request



Value Of Automated Provisioning

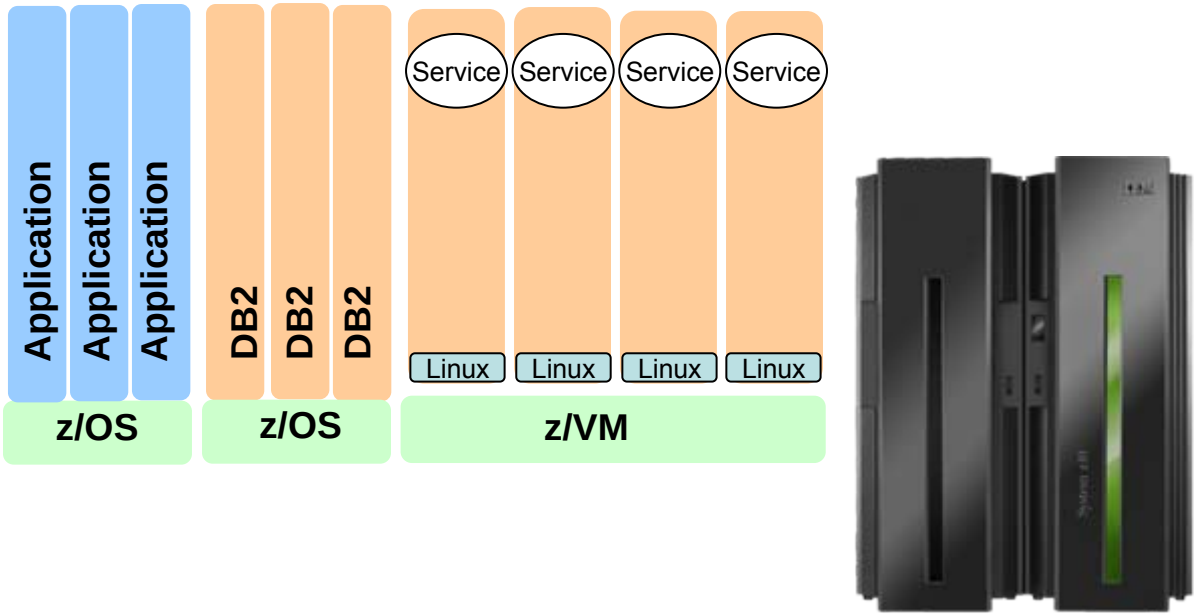
- Automation reduces the labor (time and effort) required
- Time to initial deployment is reduced
- Better image control yields improved stability of systems
- Consistent configurations between test and production minimizes differences across environment
- Critical updates (security, stability, performance) can be automated and scheduled across all systems
- Changes to systems can be automated and scheduled by the support team

Techniques For Automated Provisioning

- Clone pre-configured image templates using disk copy
  - z/VM Center
  - Very fast
- Install and configure environments based on pre-built workflows
  - Tivoli Provisioning Manager (TPM)

DEMO: Provisioning Using z/VM Center

Create a new Virtual Server quickly from existing template using disk cloning



IBM Systems Director

- IBM Systems Director provides base platform management
  - Included with purchase of IBM Systems
  - Provides common management tools for System z, Power Systems, System x, and BladeCenter
- IBM Systems Director Extensions for System z includes z/VM Center
  - Provides functions to deploy new z/VM virtual Linux systems easily using templates
  - Manage an individual virtual server
    - Define and manage individual Linux systems
  - Manage server complexes
    - Define and manage multiple Linux systems in a server complex
    - A server complex has a configuration profile that defines
      - Network settings
      - Linux configuration scripts
      - Disk access
      - VM Resource Manager (VMRM) performance goals
    - Configuration applicable to all Linux systems in the server complex

Tivoli Provisioning Manager

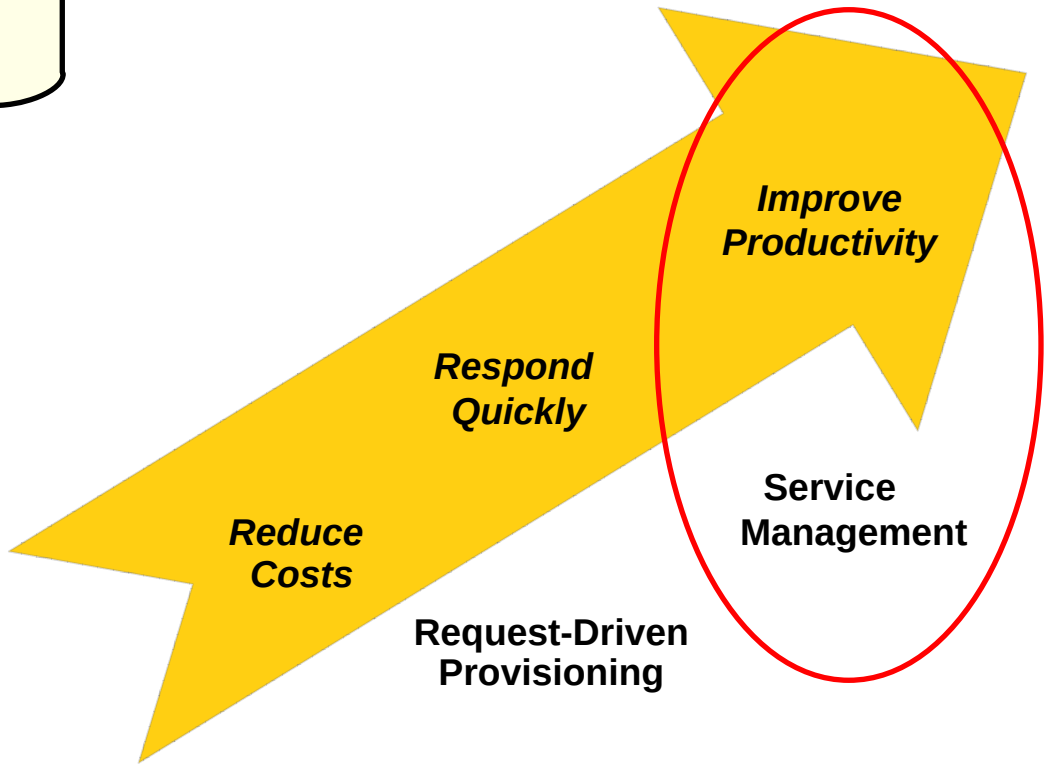
- Automates manual tasks of installing and configuring environments
  - Operating systems
  - Patches
  - Middleware
  - Applications
  - Storage and network devices
  - Virtual environments
- Tasks automated through best practice automation workflows
  - Pre-built workflows describe provisioning steps
  - Automation package developer environment to customize for data center best practices and procedures
  - Automatic workflow execution with verification at each step

Dynamic Infrastructure For A Smarter Planet

My cost of labor is very high!

Service Oriented Finance Data Center Manager

Let's Focus



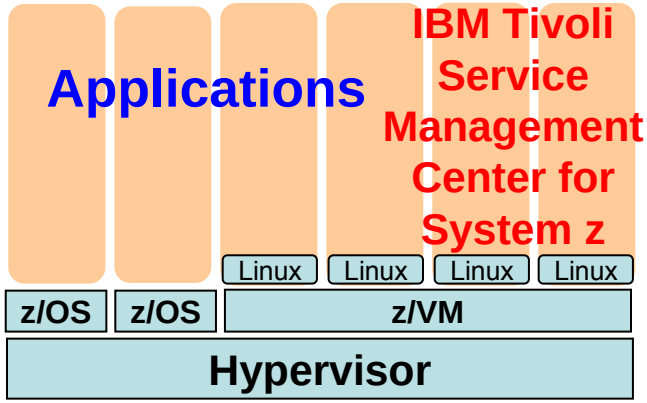
Data Centers Need A Service Management Hub To Meet Service Levels And Reduce Costs

Visibility	Control	Automation
See issues end-to-end in business context	**Standardize IT processes and provide self-service**	**Automate repeating tasks to simplify**
Respond faster and make better decisions	***Improve quality and reduce mistakes***	***Lower costs and build agility***

Solution: ***IBM Tivoli Service Management Center for System z***

Mainframe As A Service Management Hub

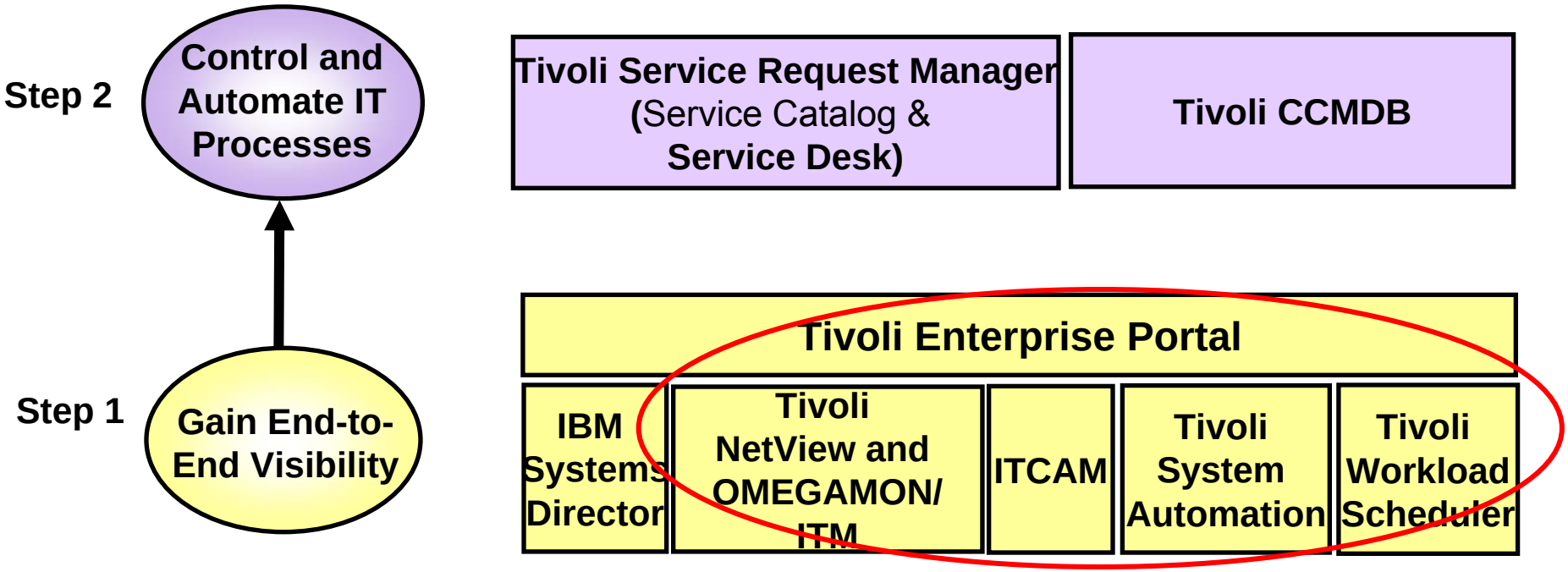
- Consolidate management on the mainframe
  - Service Management hub on Linux on z
  - z/OS supported as a managed system
- Manage the Dynamic Infrastructure
  - Best practices
  - Productivity
  - Lowest Cost



Applications

Systems Management

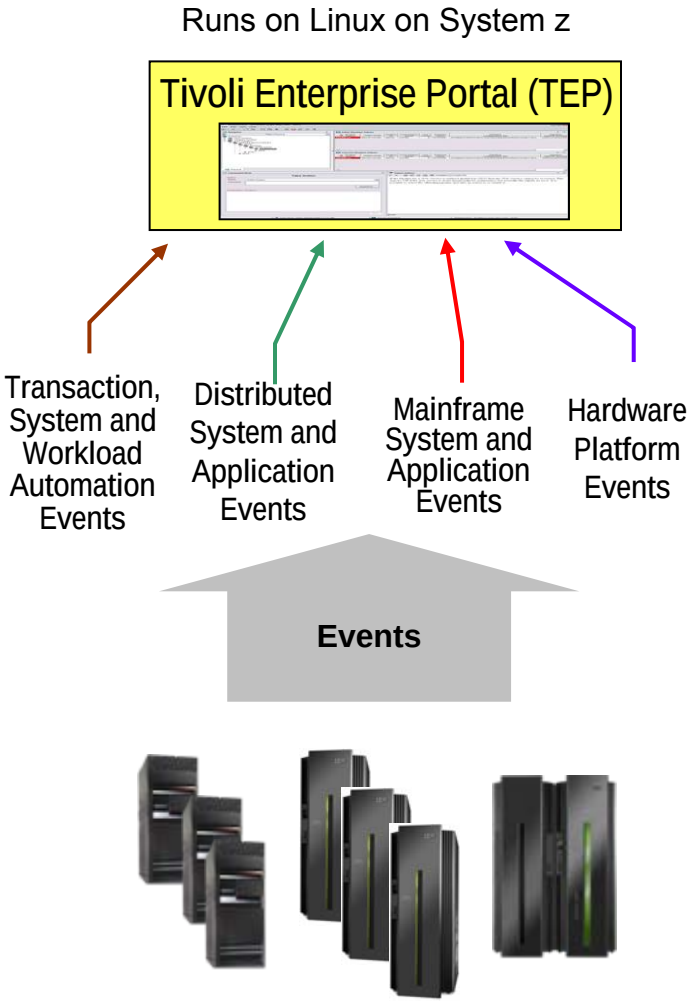
A Step By Step Approach To Implementing Tivoli Service Management Center For System z



Visibility… Control… Automation

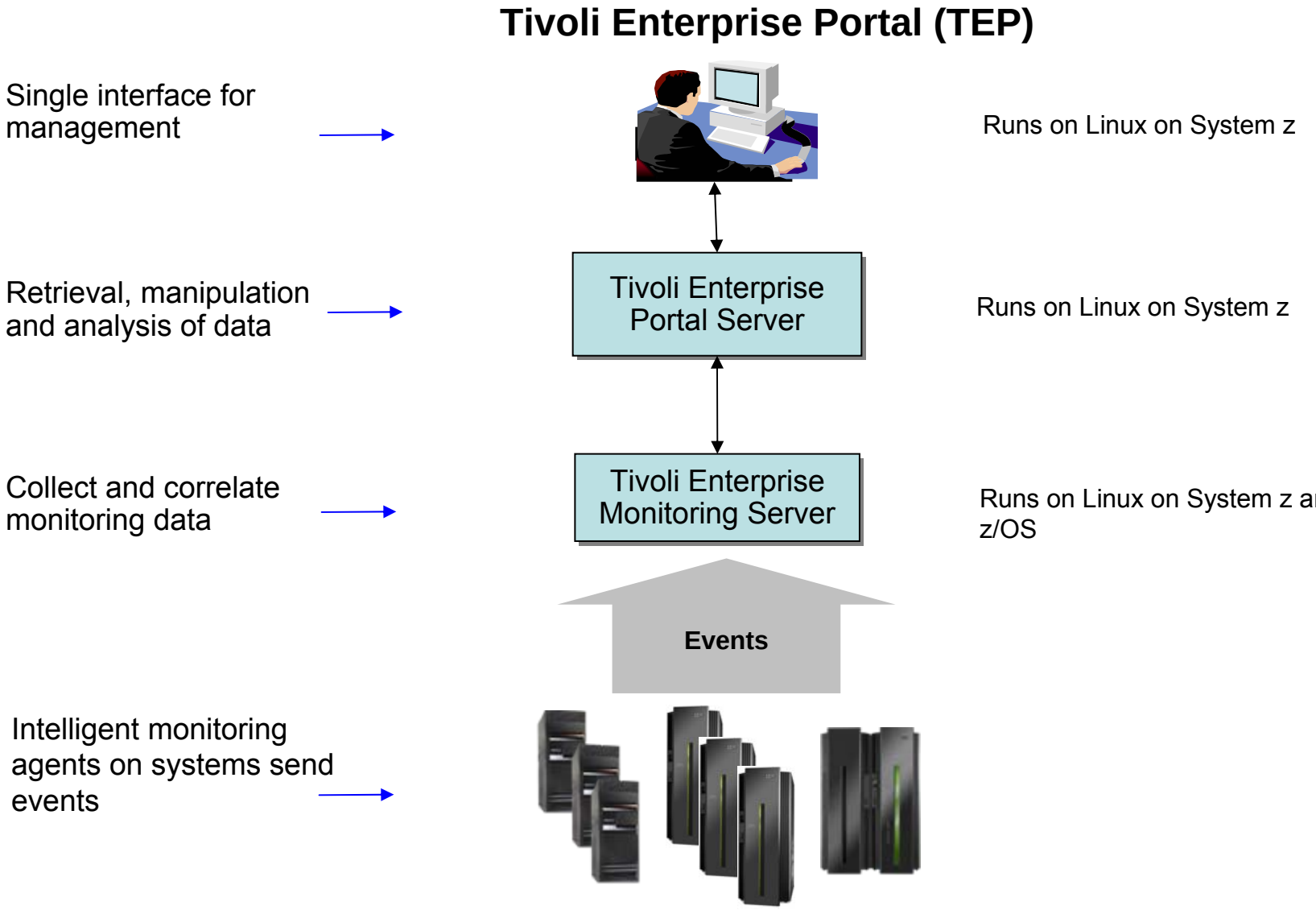
Tivoli Enterprise Portal (TEP) – A Common Monitoring Dashboard On System z

- Resource status/health from various event sources:
  - Hardware events from **IBM Director**
  - Mainframe events from **Tivoli OMEGAMON**
  - Distributed events from **Tivoli Monitoring (ITM)**
  - Transaction events from **Tivoli Composite Application Manager (ITCAM)**
  - System automation events from **Tivoli System Automation (TSA)**
  - Batch workload events from **Tivoli Workload Scheduler (TWS)**
  - Events from 3rd party monitors
- Detect incidents with *situations*
  - Out-of-the-box supplied *situations* include combination of metrics and thresholds
  - Built-in situation editor allows to customize
- *Expert advice* helps obtain detailed explanation and recommendation for resolution
- *Take action* to automatically resolve recurring problems with existing or customized scripts



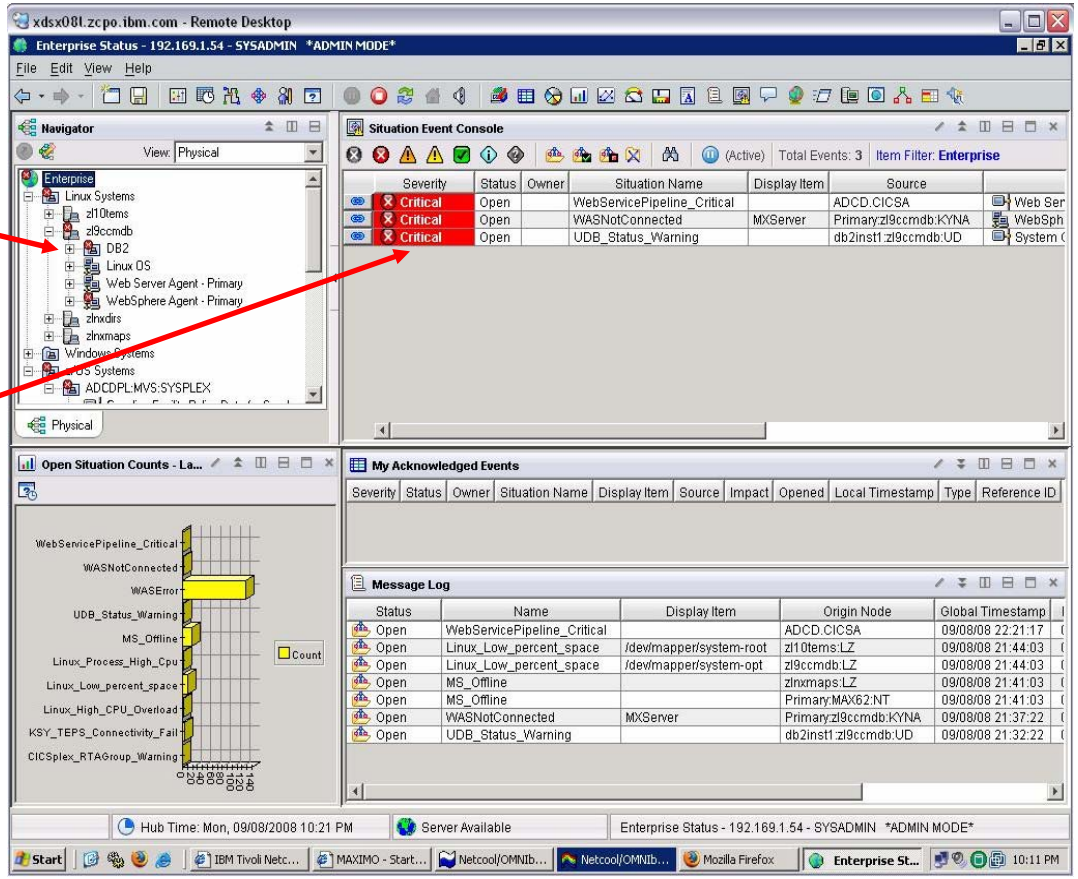
Visibility to What's Going On

End-To-End Visibility With Intelligent Monitoring



DEMO: Tivoli Enterprise Portal (TEP)

- Monitor resources end-to-end with workspaces
- *Situations* triggered by problems, for example:
  - CICS application not responding
  - DB2 application has issues



A Dynamic Role-based Portal for End-to-End Monitoring!

Tivoli NetView And Tivoli OMEGAMON XE – Monitor Mainframe Resources

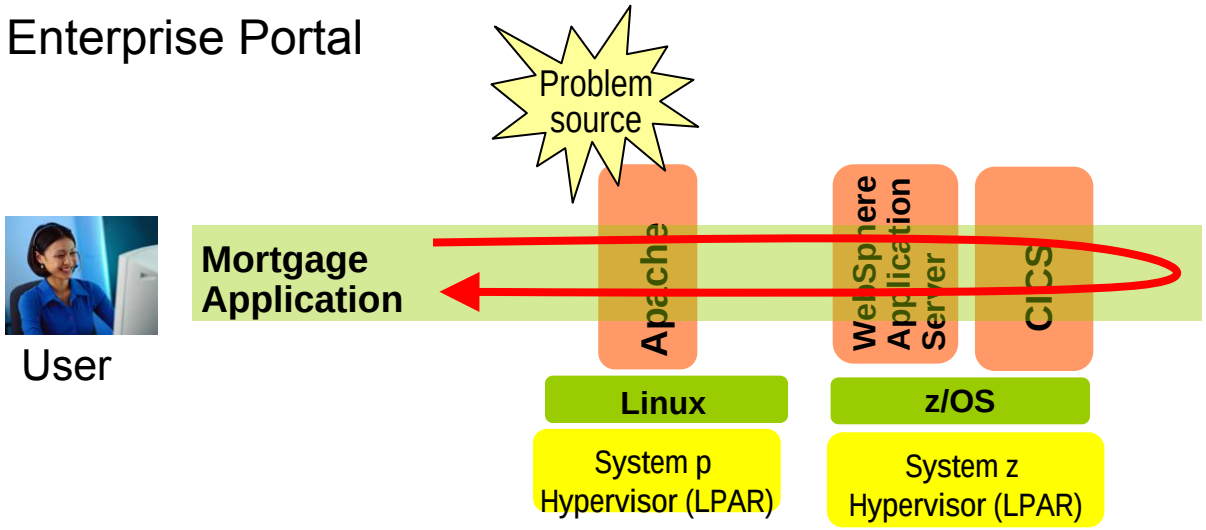
- Tivoli NetView and Tivoli OMEGAMON XE agents for mainframe servers
  - *NetView on z/OS* – monitor and control TCP/IP and SNA networks to help maintain high availability
  - *OMEGAMON XE on z/OS* – monitor key resources such as CPU, LPARs, I/O, network, enqueue, paging, zIIP, zAAP, Cryptoprocessors
  - *OMEGAMON XE on z/VM and Linux* – monitor z/VM and Linux usage of resources such as CPU, network, storage
  - *OMEGAMON XE for Mainframe Networks* – collect data and diagnose network performance issues across z/OS systems
  - *OMEGAMON XE for DB2 PM/PE on z/OS* – monitor performance of DB2 in a z/OS environment
  - *OMEGAMON XE for IMS on z/OS* – manage IMS systems
  - *OMEGMAON XE for CICS on z/OS* – manage CICS systems

Tivoli Monitoring – Monitor Distributed Resources

- Tivoli Monitoring agents for distributed servers
  - *Monitoring* (base) – monitor system resources such as CPU, I/O, network
  - *Monitoring for Database* – monitor availability and performance of distributed databases such as DB2, Oracle, Microsoft SQL Server
  - *Monitoring for Business Integration* – manage IBM WebSphere MQ, WebSphere MQ Integrator, WebSphere MQ Workflow and IBM WebSphere Interchange Server
  - *Monitoring for Applications* – monitor SAP
  - *Monitoring for Messaging and Collaboration* – monitor Lotus Domino

Tivoli Composite Application Manager (ITCAM) – End-To-End Transaction And SOA Management

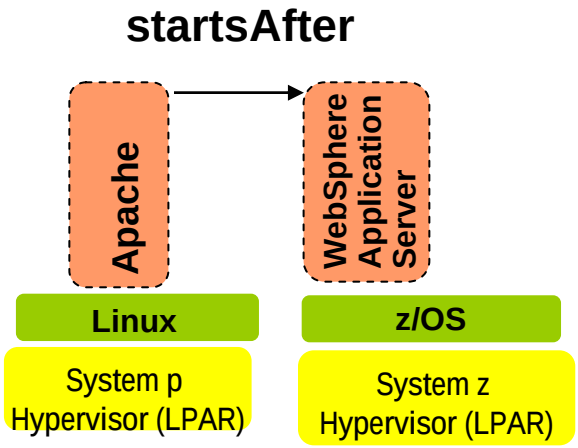
- Tracks transaction performance end-to-end across multiple physical and/or virtual systems to isolate bottlenecks quickly
  - Isolate source of performance problem across web servers, WebSphere and WebLogic application servers, CICS, IMS and DB2 subsystems, as well as ERP environments
- Monitors and performs simple control of message traffic between Web services in the SOA environment
  - Filter messages based on user-configurable criteria
- Sends events to Tivoli Enterprise Portal



Visibility to Track End-To-End Transactions

Tivoli System Automation (TSA) – Automate System Operations

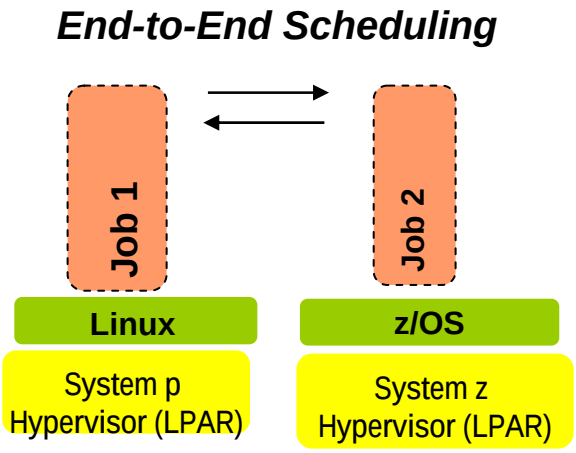
- Automate operations on hardware, I/O and applications
- No Scripts, policy-based automation
- Can manage relationship between resources and grouping of resources to automate at application level
- Includes out-of-the-box automation modules for middleware such as IMS, CICS, DB2, mySAP, WebSphere
- Can enable end-to-end application startup and shutdown across System z and distributed platforms
- Sends events to Tivoli Enterprise Portal



Automate Routine Operations

Tivoli Workload Scheduler (TWS) – Batch Workload Automation

- Enables planning for hundreds of thousands of jobs, resolves interdependencies, launches and tracks each job
- Powerful calendar-based and event-based scheduling capabilities
- Automatic recovery of jobs
- Workload Manager (WLM) integration to optimize resource utilization and favor late critical jobs
- Provides a single point of control for System z workloads or enterprise-wide workloads in end-to-end environments
- Sends events to Tivoli Enterprise Portal



Automate Job Scheduling

Control And Automate IT Processes

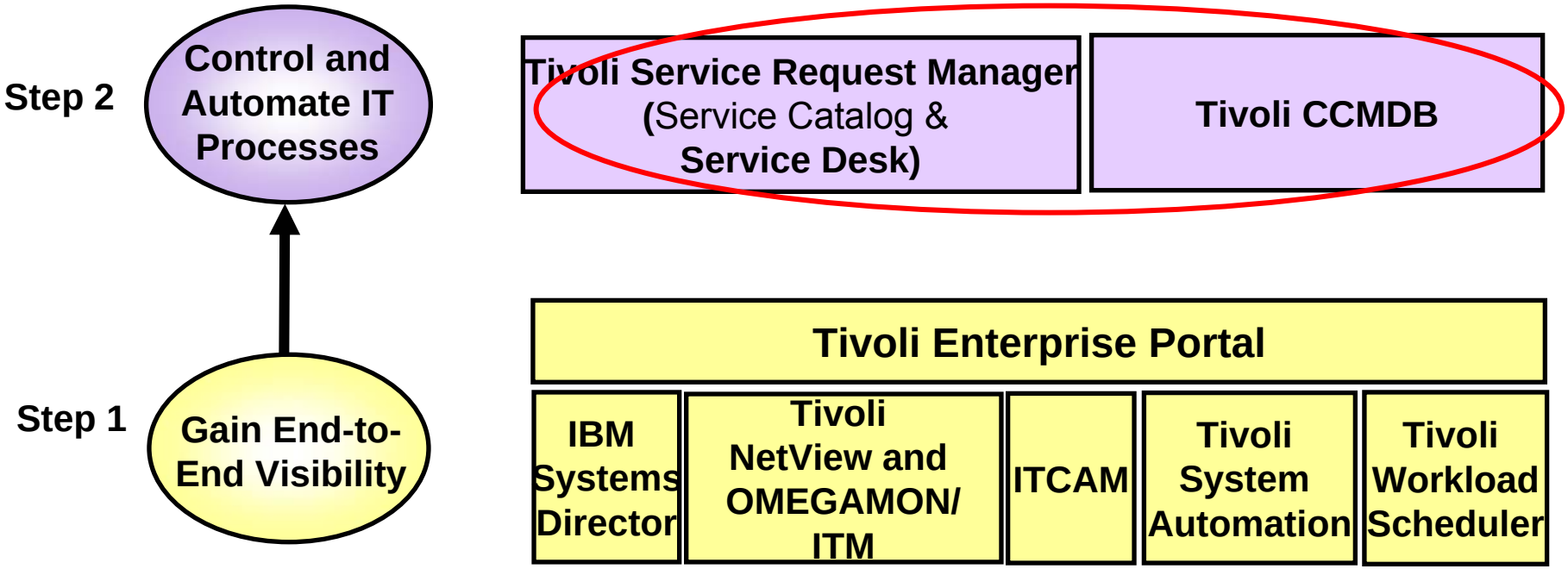
One of my key staff members is leaving.

My new employees don't have the experience to handle problems when they come up.

Data Center Manager

New Employee

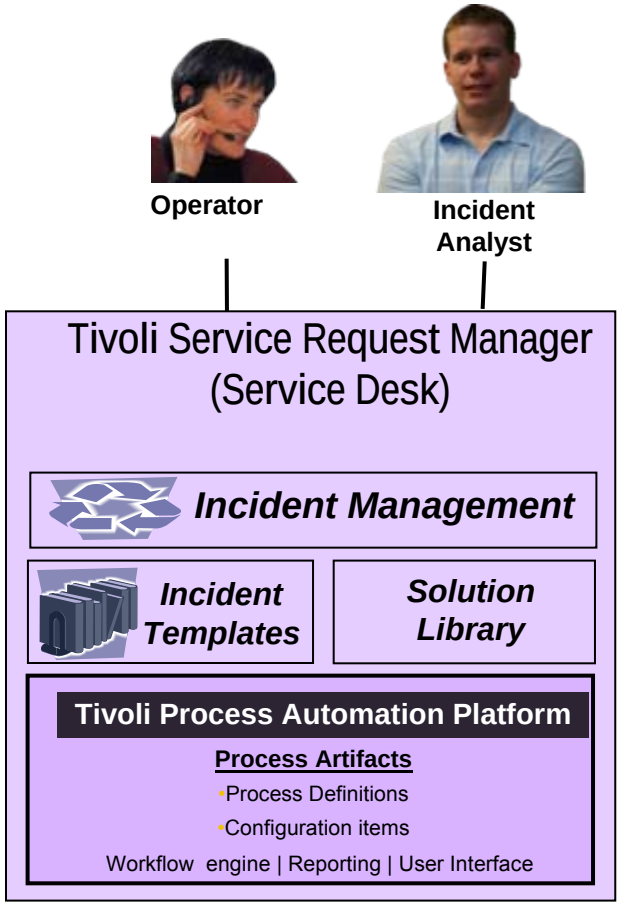
A Step By Step Approach To Implementing Tivoli Service Management Center For System z



Visibility… Control… Automation

Tivoli Service Request Manager (Service Desk) – Control Incident Management Process

- Central point to control service requests for help, information and service
- Create incident templates for common service desk calls and library of reusable solutions
  - Use templates to quickly create tickets
  - View updates and search library for solutions
- Automate incident management process
- Built on the common Tivoli Process Automation Platform to enable integration with other processes via common UI, common workflow engine, common database

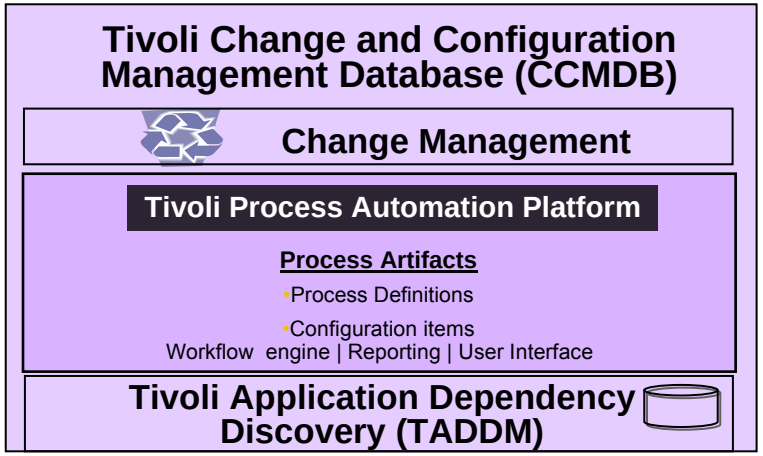


Runs on Linux on System z

Capture and Execute Best Practices

Tivoli Change And Configuration Management Database (CCMDB) – Discover And Manage Changes

- Discover assets and keep track of changes
  - Discovery library adapter for z/OS
  - 200 out-of-the-box sensors discover distributed resources
- Automated dependency mapping via application descriptors
  - Capture information about modules in business applications via descriptors
- Leverages common Tivoli Process Automation Platform to enable integration of change process with other processes
  - Common UI
  - Common workflow engine
  - Common database



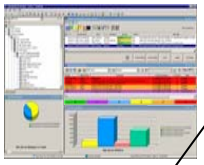
Out-of-the-box Automated Discovery

Auto Discover New Assets

Tivoli CCMDB – Control And Automate Change Management Process

- Associate change window with configuration items (managed assets)
  - Check for schedule conflicts
  - Prevent changes from occurring outside defined window
- Identify the impact of implementing a change
  - Identify and record impacted configuration items using discovered relationship data
  - Subject Matter Experts can document assessment results
  - Get Approvals from all stakeholders before implementing change
- Out-of-the-box best practices and customizable change management process

Mainframe As A Service Management Hub With Tivoli Service Management Center For System z



Applications

Agents

Agents

IBM Tivoli Service Management Center for System z

Tivoli Enterprise Portal

Tivoli Workload Scheduler
Tivoli System Automation
ITCAM
Tivoli NetView and OMEGAMON/ITM

IBM Systems Director

Tivoli Service Request Manager (Service Desk and Service Catalog)

Tivoli CCMDB

Linux | Linux | Linux | Linux

z/OS | z/OS | z/VM

Hypervisor

Management Focal Point

System Management Software Costs Less On A Consolidated zLinux Platform

Here are more cost savings…

It costs less to install system management software on zLinux than it does to install comparable software in the unconsolidated environment

IBM

Tivoli Or CA Solution Used To Manage 100 Distributed Linux Servers

WAS/DB2

100 Servers (200 PVU or Quad-core for each server)

3 authorized administrator licenses; 8 concurrent administrator licenses*

manage

Tivoli CCMDB

Tivoli Service Request Manager

ITCAM for Applications

OR

CA CMDB

CA Change Manager

CA Service Desk

CA Unicenter (WebSphere, DB2)

Tivoli software total (5 yr): $1,567,960

CA software total (5 yr): $4,883,993

*Customer case used as a basis – 1 authorized user per 40 servers , 1 concurrent user per 13 servers

Tivoli Or CA Software (Distributed) Pricing

Parts	1st Year	2nd- 5th Year Maintenance
Tivoli CCMDB (base)	$83,600	$66,800
Tivoli CCMDB (VU)	$50,000	$40,000
Tivoli CCMDB (authorized user)	$3,150	$2520
Tivoli CCMDB (concurrent user)	$21,040	$16,800
TSRM (authorized user)	$8,250	$6,600
TSRM (concurrent user)	$55,040	$44,160
ITCAM for Applications (PVU)	$650,000	$520,000
TOTAL	$871,080	$696,880

Parts	1st Year	2nd- 5th Year Maintenance
CA CMDB	$50,000	$40,000
CA CMDB Agent	$100,000	$80,000
CA Change Manager	$10,000	$8,000
CA Change Manager (user)	$5385	$4,308
CA Service Desk (user)	$38,500	$30,800
CA Unicenter (WebSphere, DB2)	$2,509,400	$2,007,600
TOTAL	$2,713,285	$2,170,708

5 year Tivoli Total: $1,567,960

5 year CA Total: $4,883,993

Tivoli Solution Used to Manage 100 Distributed Linux Servers w/TSA & TWS

WAS/DB2

100 Servers (200 PVU or Quad-core for each server)

3 authorized administrator licenses; 8 concurrent administrator licenses*

manage

Tivoli CCMDB

Tivoli Service Request Manager

ITCAM for Applications

Tivoli System Automation

Tivoli Workload Scheduler

Tivoli software total (5 yr): $3,793,960

Parts	1st Year	2nd- 5th Year Maintenance
Tivoli CCMDB (base)	$83,600	$66,800
Tivoli CCMDB (VU)	$50,000	$40,000
Tivoli CCMDB (authorized user)	$3,150	$2,520
Tivoli CCMDB (concurrent user)	$21,040	$16,800
TSRM (authorized user)	$8,250	$6,600
TSRM (concurrent user)	$55,040	$44,160
ITCAM for Applications (PVU)	$650,000	$520,000
Tivoli System Automation (PVU)	$660,000	$528,000
Tivoli Workload Scheduler (PVU)	$576,000	$462,000
TOTAL	$2,107,080	$1,686,880

*Customer case used as a basis – 1 authorized user per 40 servers , 1 concurrent user per 13 servers

Tivoli Solution Used To Manage Consolidated Environment On VMware

WAS/DB2

13 physical servers to consolidate (400 PVU or 8-core for each server)

1 authorized administrator licenses; 1 concurrent administrator licenses*

manage

Tivoli CCMDB

Tivoli Service Request Manager

ITCAM for Applications

Tivoli System Automation

Tivoli Workload Scheduler

Tivoli software total (5 yr): $1,086,160

Parts	1st Year	2nd- 5th Year Maintenance
Tivoli CCMDB (base)	$83,600	$66,800
Tivoli CCMDB (VU)	$6,500	$5,200
Tivoli CCMDB (authorized user)	$1,050	$840
Tivoli CCMDB (concurrent user)	$5,260	$4,200
TSRM (authorized user)	$2,750	$2,200
TSRM (concurrent user)	$13,760	$11,040
ITCAM for Applications (PVU)	$169,000	$135,200
Tivoli System Automation (PVU)	$149,760	$120,120
Tivoli Workload Scheduler (PVU)	$171,600	$137,280
TOTAL	$603,280	$482,880

*Customer case used as a basis – 1 authorized user per 40 servers , 1 concurrent user per 13 servers

Tivoli Solution On zLinux Used To Manage Consolidated Environment On zLinux

WAS/DB2

IFL IFL
IFL IFL
IFL IFL
IFL IFL
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IFL IFL
IFL IFL
IFL IFL
IFL IFL
IFL IFL

20 IFL on System z EC to consolidate on System z (120 PVU each)

1 authorized administrator license; 2 concurrent administrator license

manage

Tivoli CCMDB

Tivoli Service Request Manager

ITCAM for Applications

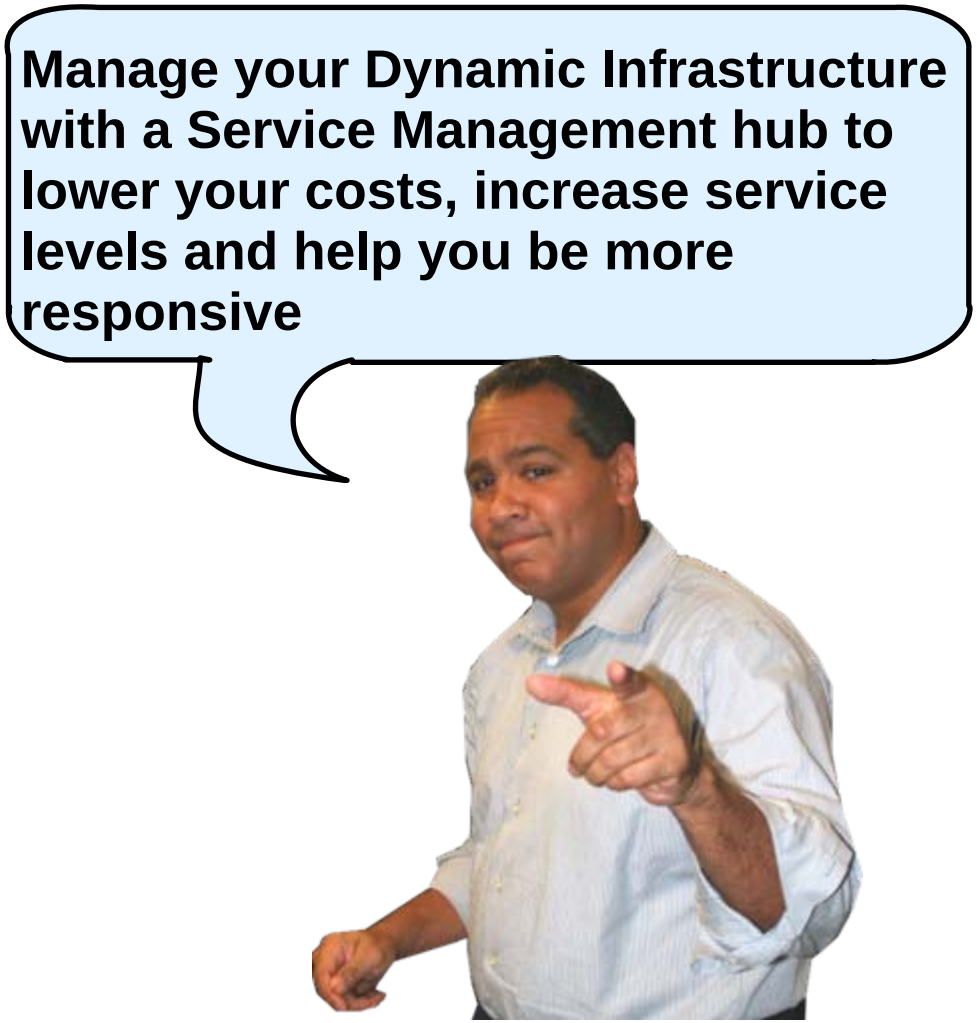
Tivoli System Automation

Tivoli Workload Scheduler

5 year Tivoli software total on System z: $617,020

Parts	1st Year	2nd- 5th Year (Maint)
Tivoli CCMDB (base)	$83,600	$66,800
Tivoli CCMDB (VU)	$10,000	$8,000
Tivoli CCMDB (authorized user)	$1,050	$840
Tivoli CCMDB (concurrent user)	$5,260	$4,200
TSRM (authorized user)	$2,750	$2,200
TSRM (concurrent user)	$13,760	$11,040
ITCAM for Applications (PVU)	$78,000	$62,400
Tivoli System Automation (PVU)	$69,120	$55,440
Tivoli Workload Scheduler (PVU)	$79,200	$63,360
TOTAL	$342,740	$274,280

Summary


Manage your Dynamic Infrastructure with a Service Management hub to lower your costs, increase service levels and help you be more responsive
IBM