Greg Daynes
gdaynes@us.ibm.com

z/OS Software Deployment

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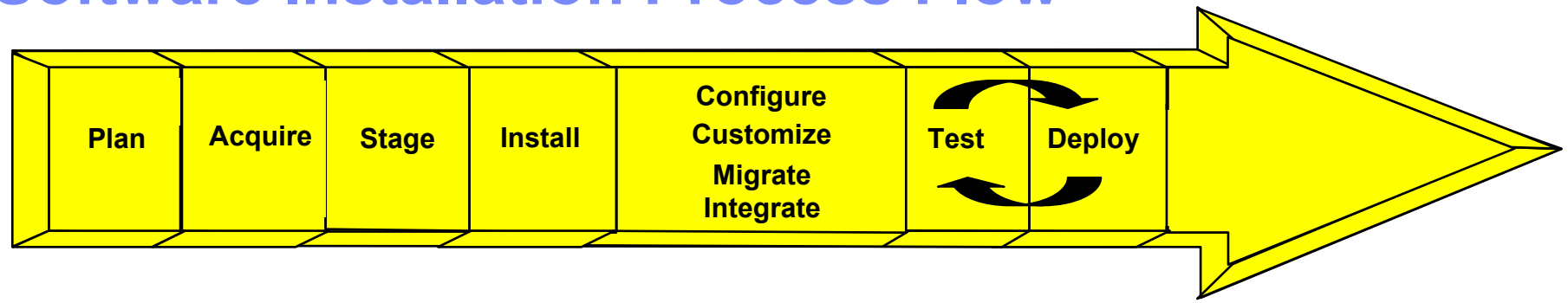
Agenda

- **Overview**
  - "Software Deployment"
  - "Software Instances"
  - Common "Software Deployment" Scenarios
  - Value of simplifying "Software Deployment"
- **IBM's New Software Deployment function of z/OSMF**
- **Software Deployment "Demo"**
  - "Clone" existing software to prepare to upgrade a product
- **Summary**

Overview

Software Installation Process Flow

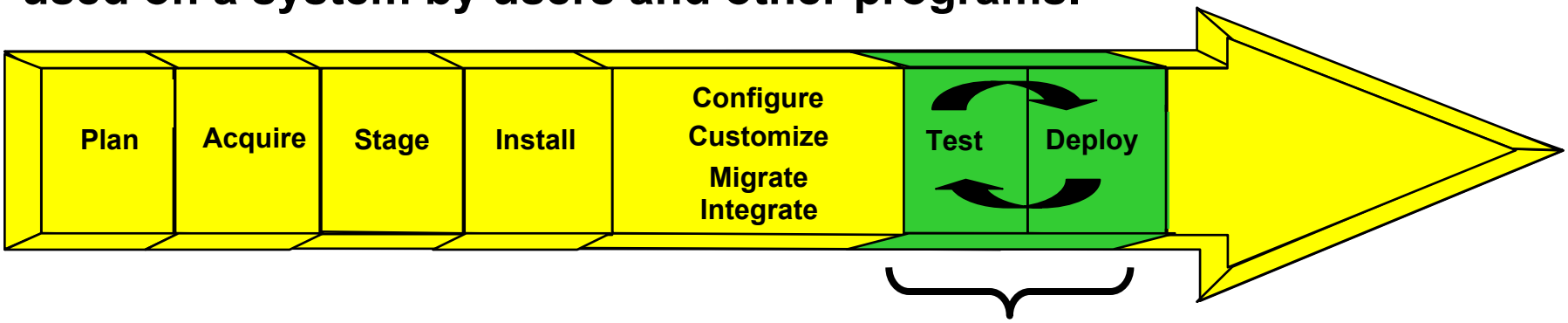


1. **Plan what hardware and software products and features are needed or desired**
2. **Acquire the products and features**
   - Order IBM software using ShopzSeries
   - Order hardware and ISV products (as needed)
3. **Stage the software**
   - Combined with acquisition for electronic distribution
4. **Install the software**
   - ServerPac (or SystemPac) installation
   - SMP/E installation for CBPDO products, web deliverables, or service
5. **Customize the software**
   - Configure features, override defaults (if necessary)
   - Migrate existing customization and perform required migration actions
   - Install/Connect middleware, ISV code, and applications
6. **Test the system**
7. **Deploy the system**
   - To other test systems, then to production systems

Note: Steps can involve multiple people with different responsibilities (roles)

What Is Meant By Software Deployment*

- Is a sub step in the end-to-end software installation flow.
- Software deployment is itself a workflow consisting of a number of steps to copy a software instance to another physical location such as another DASD volume.
- The purpose of software deployment is to make software (executable code, configuration files and operational data sets) available to be used on a system by users and other programs.



Test and Deploy Steps Are Iterative

- May need to deploy before you can test
- May need to test before deploying to a new environment
- May repeat tests and deployment several times

*As defined in this presentation by me, and used by the IBM z/OS Software Deployment function

What Is Meant By Software Deployment*

- **Can involve**
  - –Copying a software instance to different volumes or to data sets (or paths) with different names.
    - "Source" software instance identifies the software that you want to deploy
    - "Target" software instance identifies where you want the software deployed
  - –Performing customization tasks to create or update configuration files and operational data sets.
    - Can be performed:
      - o prior to software deployment for common configurations,
      - o after software deployment for instance specific configuration, or
      - o a combination of both
    - When upgrading from a prior level, some of these tasks may be identified as "migration actions".

*As defined in this presentation by me, and used by the IBM z/OS Software Deployment function

Current State of Software Deployment

- **For years IBM has left software deployment as an exercise for the user.**

- **Over time, innovative approaches were developed by our customers to deploy a fix, maintenance upgrade, or new release.**
  - Errors occurred, because all the affected parts were not copied; such as
    - Load module aliases, HFS or PDS/PDSE files/members
    - Entire libraries or file systems

- **Some customers have been reluctant to exploit new technology (for example: zFS) due to having to make changes to their cloning process.**

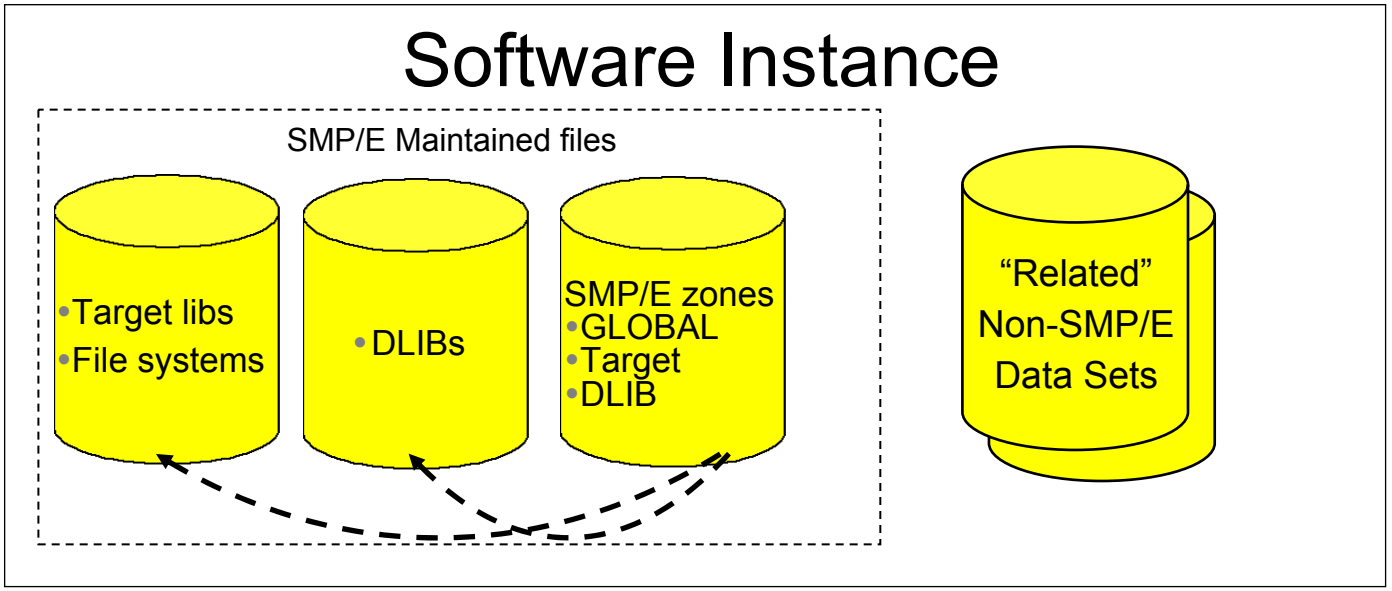
- **Many customers choose not to copy the SMP/E Consolidated Software Inventory (CSI), which makes it hard to have a software inventory of the running system.**
  - The lack of a CSI (and possibly other required SMP/E data sets) makes it impossible to install maintenance in an absolute emergency.

Future State of Software Deployment

- **Clone z/OS images and deploy software more easily and consistently, using a new z/OSMF software deployment task.**
- **Manage the deployment of ALL SMP/E packaged (IBM, ISV, and user) software**
- **Codify IBM recommended best practices for software deployment**
  - Copying all affected parts of a software update.
  - Checking requisites prior to deployment.
    - Check existing software instances for missing coexistence service
    - Check products that will interact with the deployed target software instance for missing requisites which enable them to run on the new software level
    - Check if the source software instance is missing any SYSMODs for the target environment
  - Checking possible regression of maintenance or USERMODs previously installed.
    - Check that the new release has same or equivalent required service that the software instance being replaced had
  - Identify any SYSTEM HOLDs that may need to be resolved in the target environment PRIOR to deployment
  - Deploying the SMP/E zone with the libraries

Software Instance

Software Instance



- **Definition: For z/OS platform software, the SMP/E target and distribution zones that are associated with a product set and the target and distribution libraries described by those zones.**
  - The SMP/E zones point to the target and distribution libraries
    - DLIB data sets and DLIB zones are optional
  - Non-SMP/E data sets can include:
    - Other runtime libraries
    - Configuration files and operational data sets
    - Non-SMP/E maintained ISV or user libraries

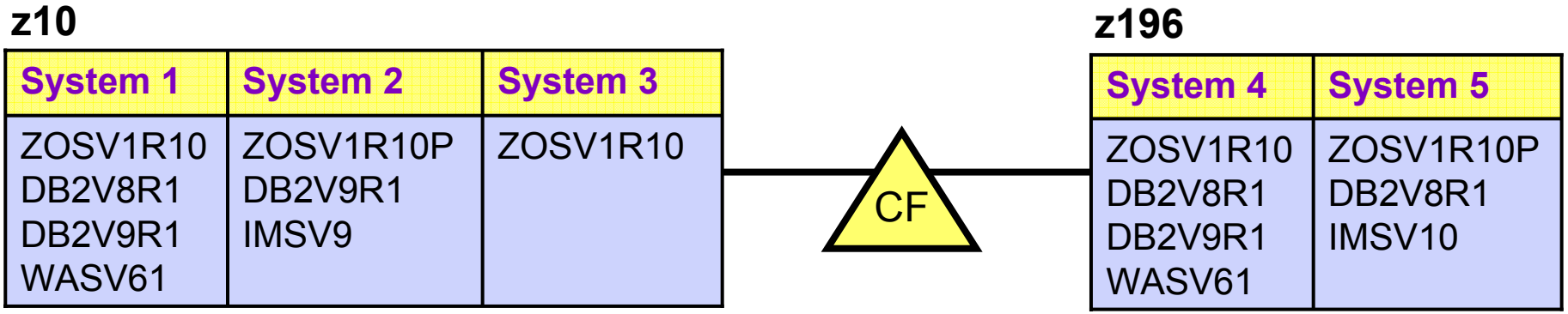
Software Instance …

- Recommendation: Each software instance should contain one or more software products that you install, maintain, backup, recover and deploy as a group.
  - The "*z/OS Planning for Installation*" book uses the term "product set" for this group of products.

- A number of software instances can be accessible on a z/OS system.
  - When used as a driving system, the target system software instances that will be updated during installation are accessible.
  - A running system contains one or more software instances that are used during software execution.

- Software instances can be shared among one or more z/OS systems in a sysplex, for example:
  - Two z/OS LPARs IPLed from the same SYSRES.
  - Two DB2 instances using the same DB2 libraries.

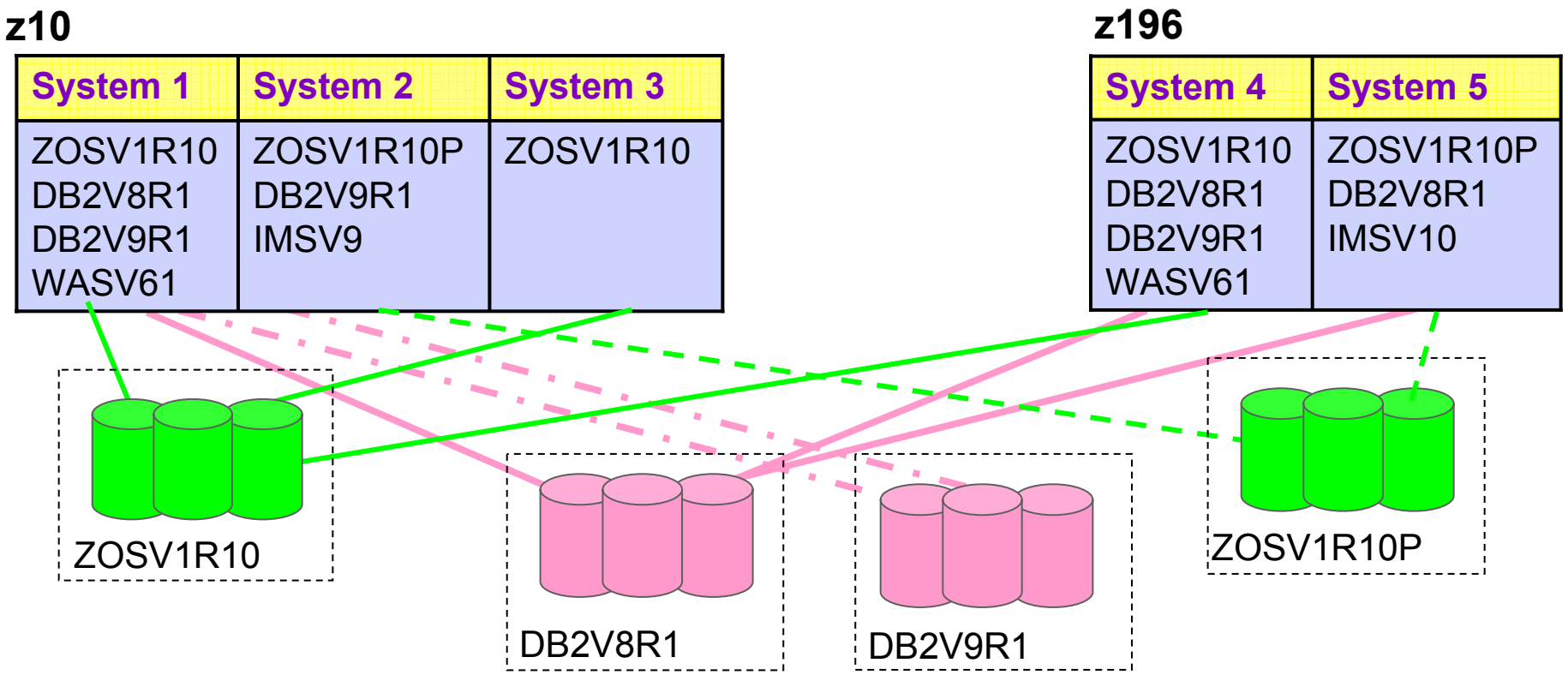
Software Instances in a Parallel Sysplex (1 of 2)



Environment

- **2 Servers (CPCs)**
- **5 z/OS Images (LPARs)**
  - Systems 1 – 5

Software Instances in a Parallel Sysplex (2 of 2)



Environment

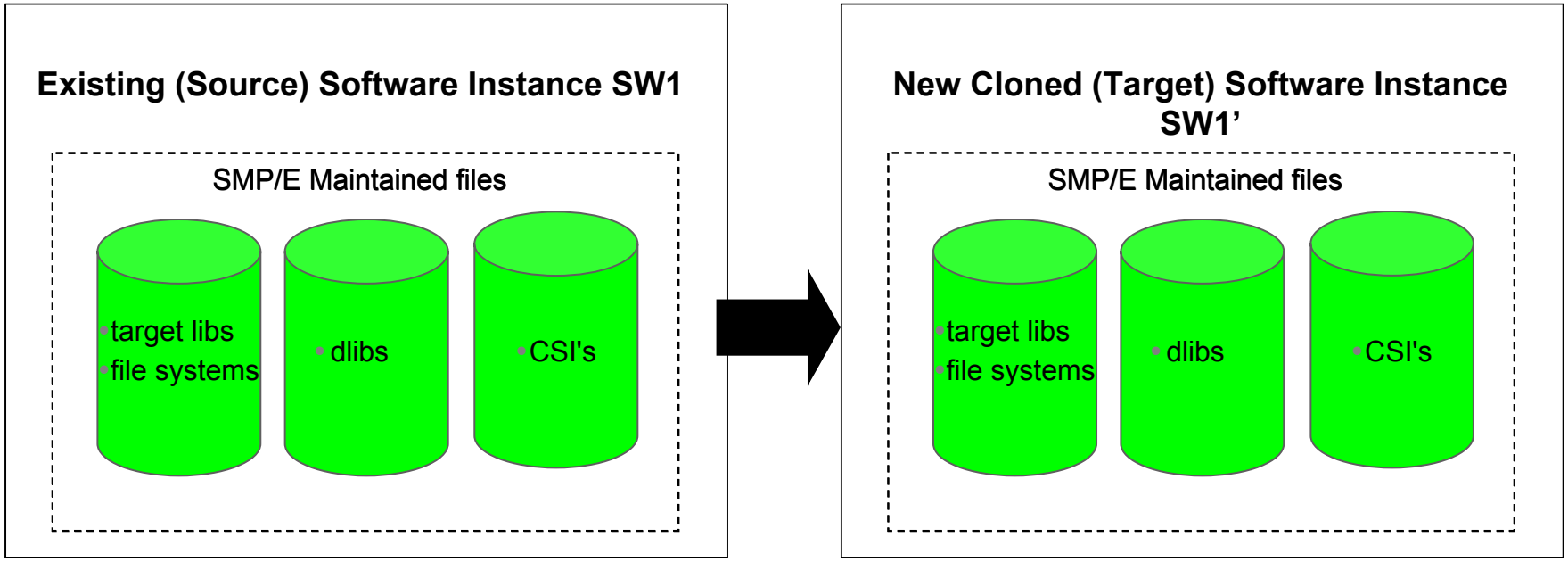
- **5 z/OS images share 2 z/OS software instances (ZOSV1R10, ZOSV1R10P)**
- **4 z/OS images share 2 DB2 software instances (DB2V8R1, DB2V9R1)**
  - Both DB2 instances are used on system System 1

Common Deployment Scenarios

Common Software Deployment Scenarios

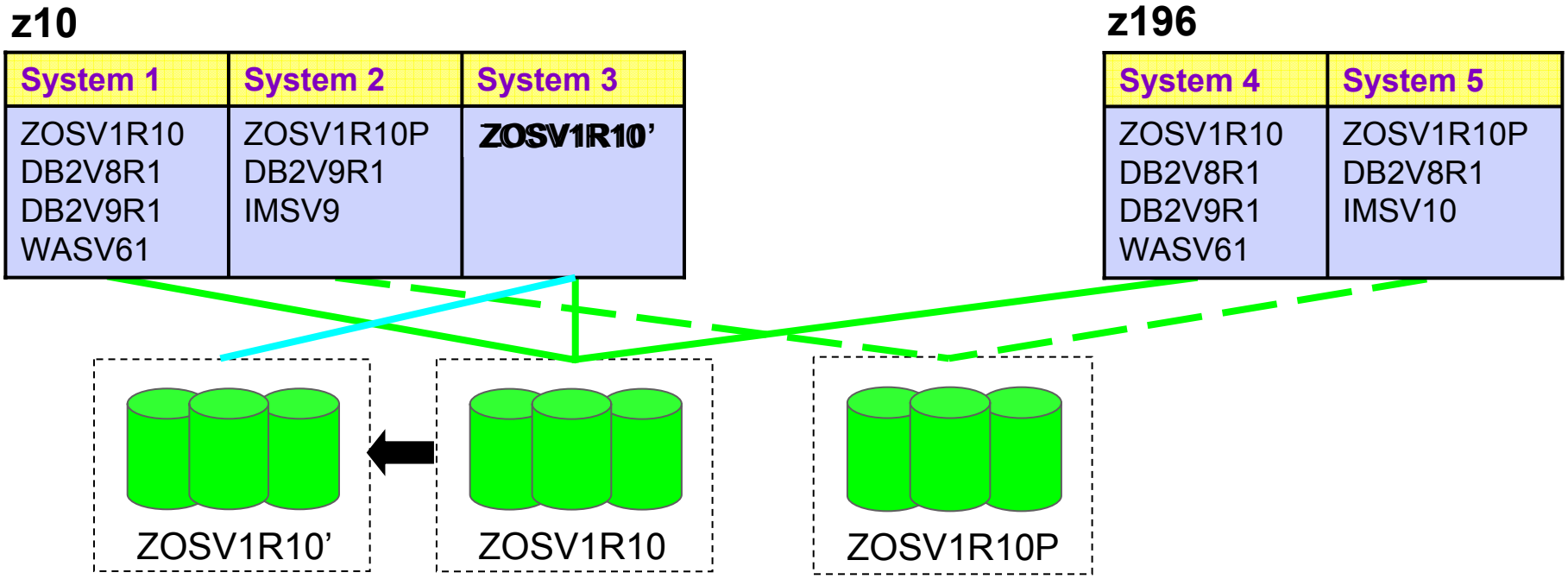
1. **"Clone" existing software to prepare to upgrade a product**
2. **Deploy a new software level of one or more product sets, either**
   - A new release
   - A new maintenance level
3. **Create an executable image from software installed into "work" data sets**
   - The "work" data sets are usually SMS managed, or uniquely named

"Clone" Existing Software to Prepare to Upgrade a Product



1. Start with existing product installed in Existing (Source) Software Instance SW1
2. Create new cloned (target) software instance SW1'
   - Copy libraries
   - Copy SMP/E zone(s)
   - Update DDDEFs accordingly
   - Catalog data sets (if necessary)

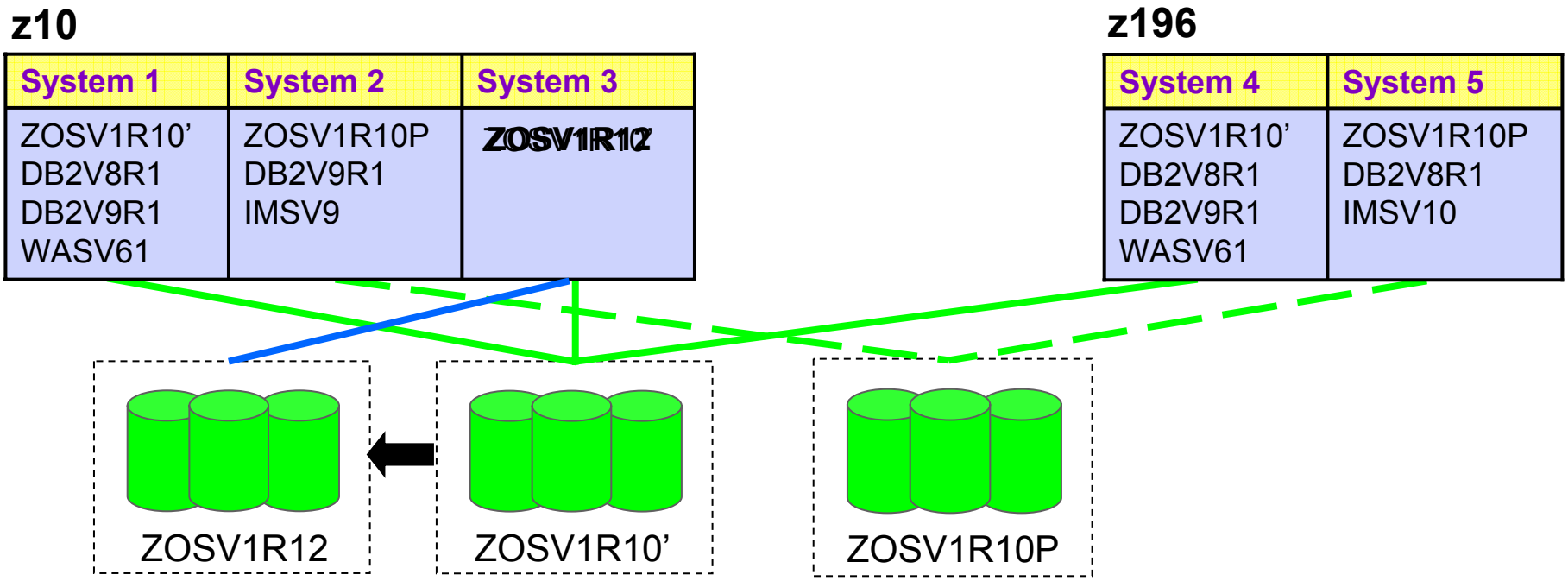
Deploy Maintenance Upgrade Software Instances in a Parallel Sysplex



When changing software levels

1. **Create a new sw instance, or if the instance is not in use replace an existing one**
   - Copy/rename libraries & file systems
   - Copy SMP/E zone(s)
   - Update DDDEFs accordingly
   - Catalog data sets (if necessary)
2. **Upgrade ZOSV1R10' to a new software level**
3. **Perform migration actions (or System ++HOLDs)**
4. **Check for missing requisites & regressions**
5. **Quiesce existing instance**
6. **Start a new instance or perform rolling IPLs (or activations) to introduce new software level**

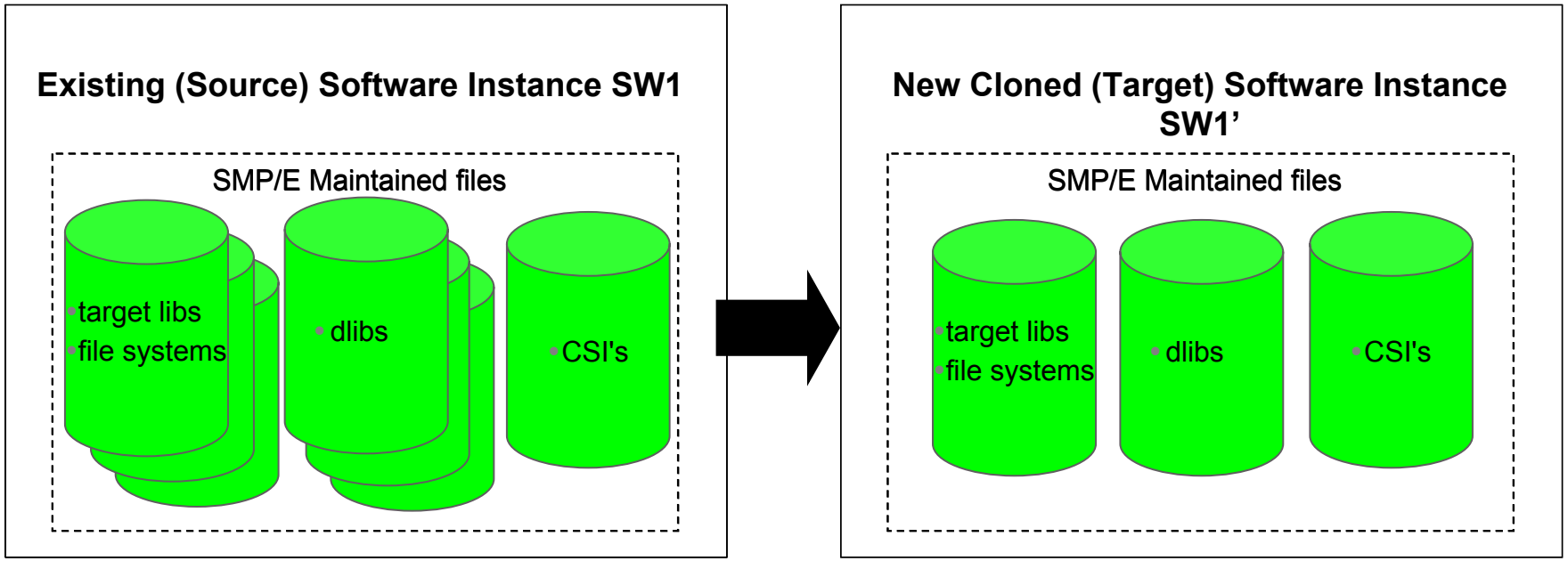
Deploy New Release Software Instances in a Parallel Sysplex



When changing software levels

1. **Create a new sw instance or if the instance is not in use, replace an existing one**
   - Copy/rename libraries & file systems
   - Copy SMP/E zone(s)
   - Update DDDEFs accordingly
   - Catalog data sets (if necessary)
2. **Upgrade ZOSV1R10' to ZOSV1R12 (a new software level)**
3. **Perform migration actions (or System ++HOLDs)**
4. **Check for missing coexistence service**
5. **Check for missing target software requisites**
6. **Quiesce existing instance**
7. **Start a new instance or perform rolling IPLs (or activations) to introduce new software level**

Create an Executable Image from Software Installed into "Work" Data Sets



1. Start with existing "work" software instance SW1 with data sets spread across volumes, possibly with unique names.
2. Create new cloned (target) software instance SW1'
   - Copy/rename libraries and file systems
   - Copy SMP/E zone(s)
   - Update DDDEFs accordingly
   - Catalog data sets (if necessary)
3. Before using new cloned software instance
   - Perform migration actions (or System ++HOLDs)
   - Check for missing requisites and regressions

z/OSMF Software Deployment

z/OSMF Software Deployment

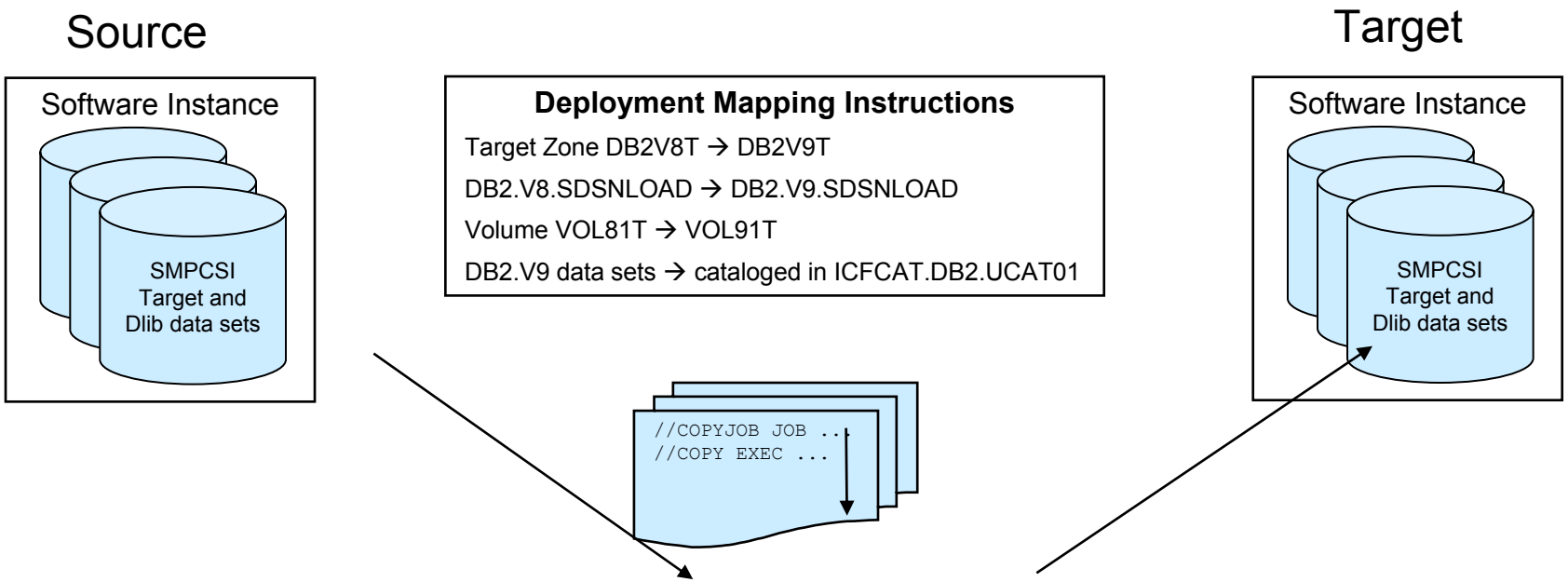
- **Previewed in the 2/15 z/OS announcement**
  - A new software deployment function is planned for z/OSMF V1.13, which is planned to run on z/OS V1.13. The software deployment function is designed to provide the functions needed to create and deploy a copy, or clone, of an existing SMP/E-installed software image, including IBM software installed using ServerPac, CBPDO, or fee-based installation offerings, as well as ISV or customer software. The function is intended to help you create and distribute copies of system software, including target libraries, distribution libraries, SMP/E zones, and related data sets you identify. Software deployment is designed as a z/OSMF application, and is intended to make it easier to manage your software images by simplifying and standardizing these deployment processes.

Software Deployment

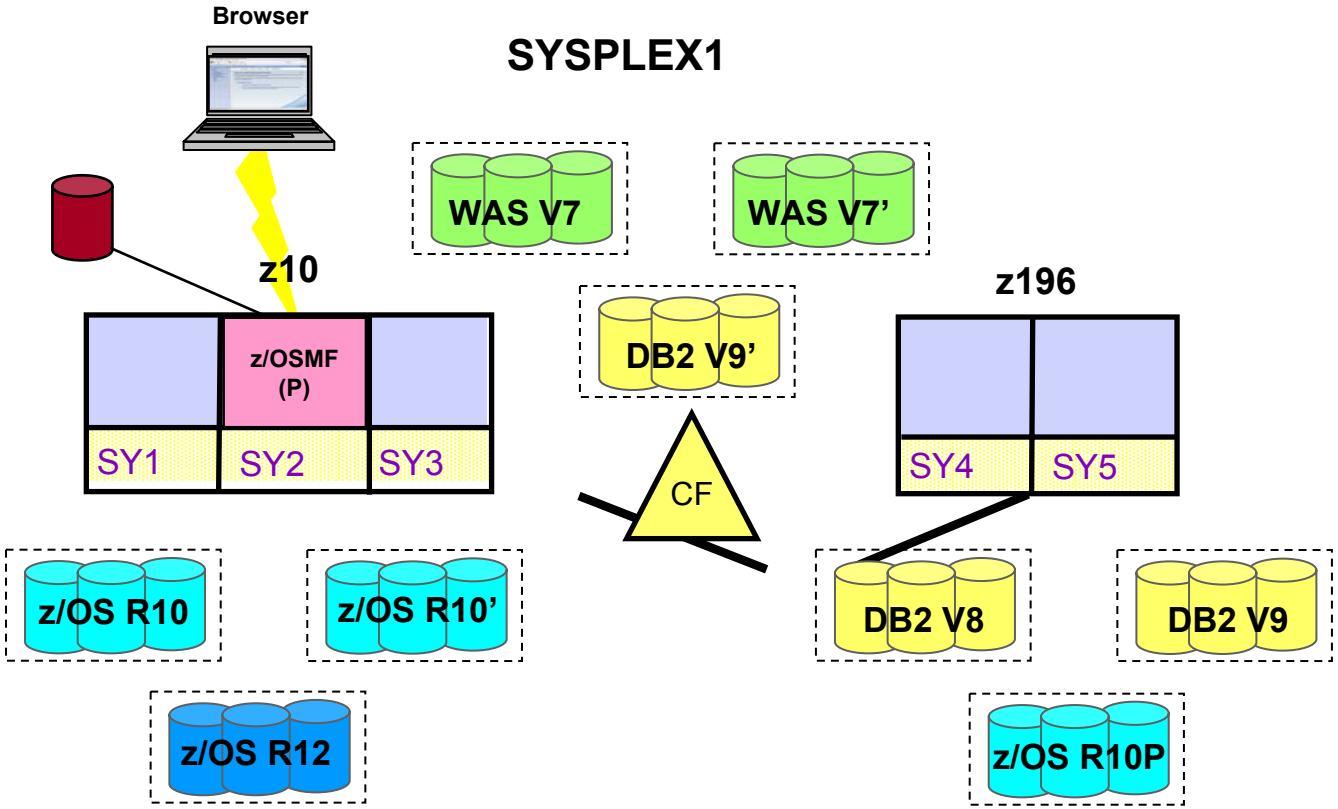
- **Software Deployment is a z/OS Management Facility (z/OSMF) plug-in application**
  - –Web-based application.
  - –User interaction is via a browser on a workstation.
  - –z/OSMF and Software Deployment will be active on one system in a sysplex, allowing access to shared DASD.
    - Locally, either on a single system or system-to-system within a sysplex.
    - Remotely, system-to-system across a network and multiple sysplexes.

Basic Deployment Operation Flow

1. Identify a Software Instance.
2. Create a Deployment that describes where the source data sets will be copied.
3. Generate Deployment Jobs.
4. Execute generated Jobs to copy the source and create (or replace) a target Software Instance.



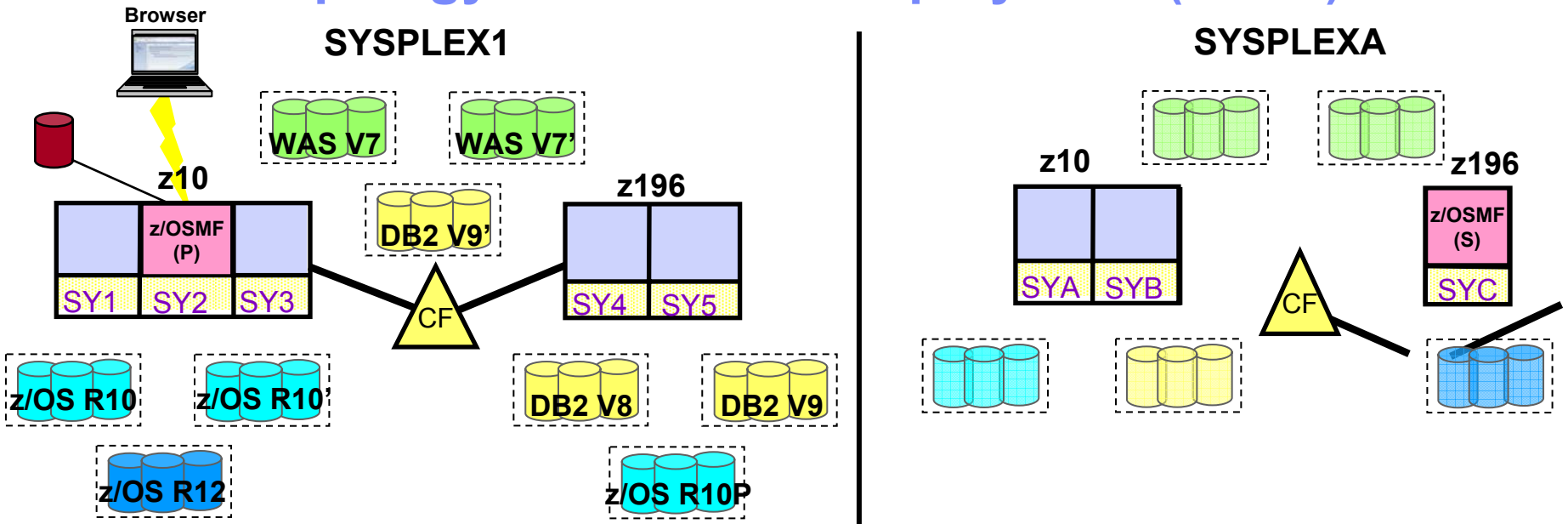
z/OSMF Topology for Software Deployment (1 of 2)



Environment

- **Systems SY1-SY5 are in SYSPLEX1**
  - ALL DASD shared across the sysplex
- **SY2 is the z/OSMF Primary system**
  - z/OSMF primary repository local to SY2
- **Only 1 system in a sysplex can run z/OSMF at a time**
- **All software instances will be defined and deployed from the primary z/OSMF system (SY2)**
  - From the primary, you can deploy an instance in SYSPLEX1 to another instance in SYSPLEX1

z/OSMF Topology for Software Deployment (2 of 2)



Environment

- **Systems SYA-SYC are in SYSPLEXA**
  - NO DASD is shared between SYSPLEX1 and SYSPLEXA
- **SYC is the z/OSMF Secondary system**
  - for remote deployments
- **Source or target software instances must be accessible from primary or secondary z/OSMF systems**
- **From the primary z/OSMF system, you can deploy:**
  - an instance in SYSPLEX1 to an instance in SYSPLEXA
  - an instance in SYSPLEXA to an instance in SYSPLEX1
  - an instance in SYSPLEXA to another instance in SYSPLEXA

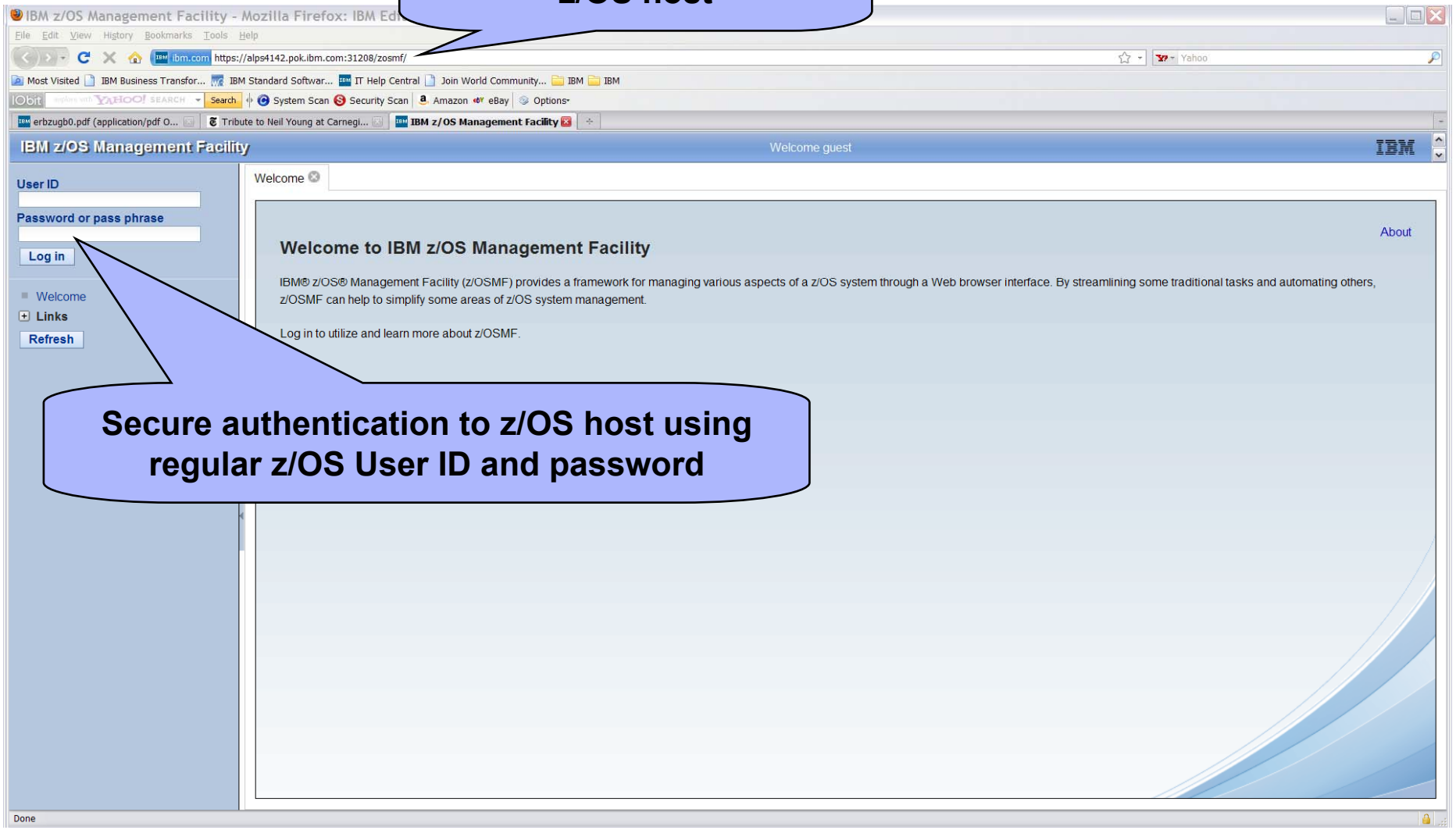
z/OSMF Software Deployment "Demo"

Software Deployment Demo

“Clone” existing software to prepare to upgrade a product

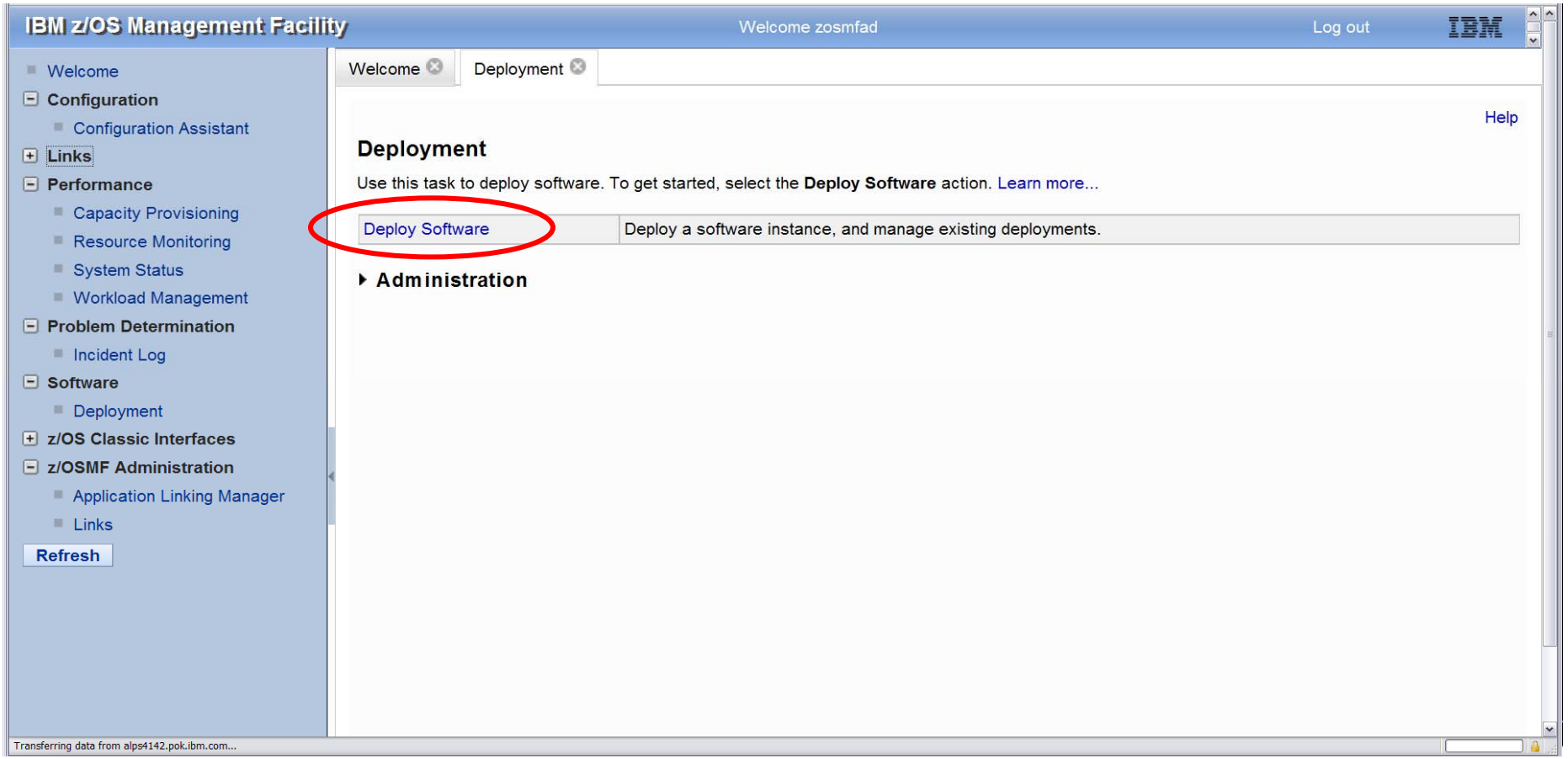
- Copy libraries and filesystems
- Update DDDEFs to reflect copied libraries and pathnames
- Change data set names of catalogued data sets (file systems and CSI data sets

Welcome

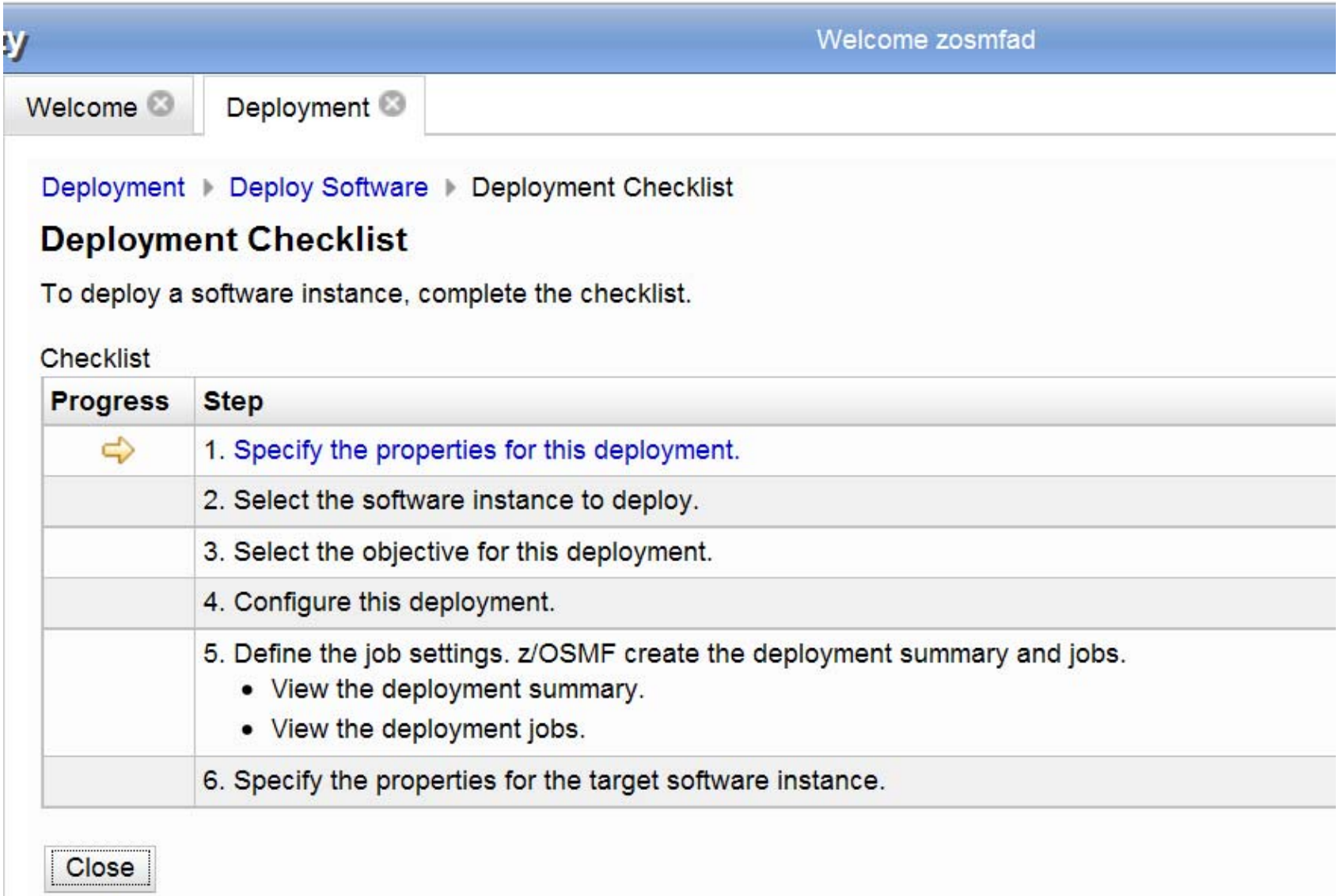


Welcome for logged on user

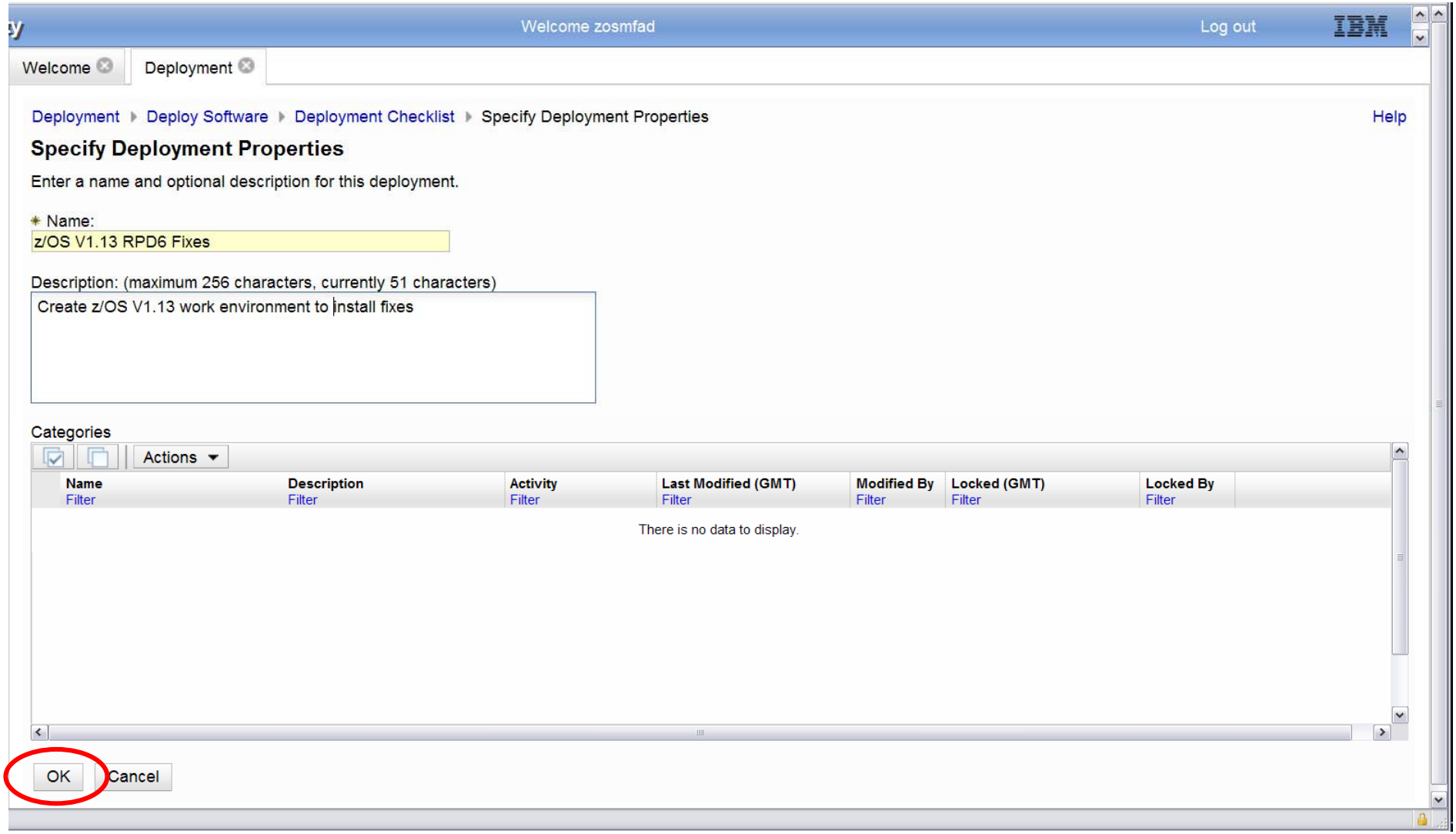
Software Deployment



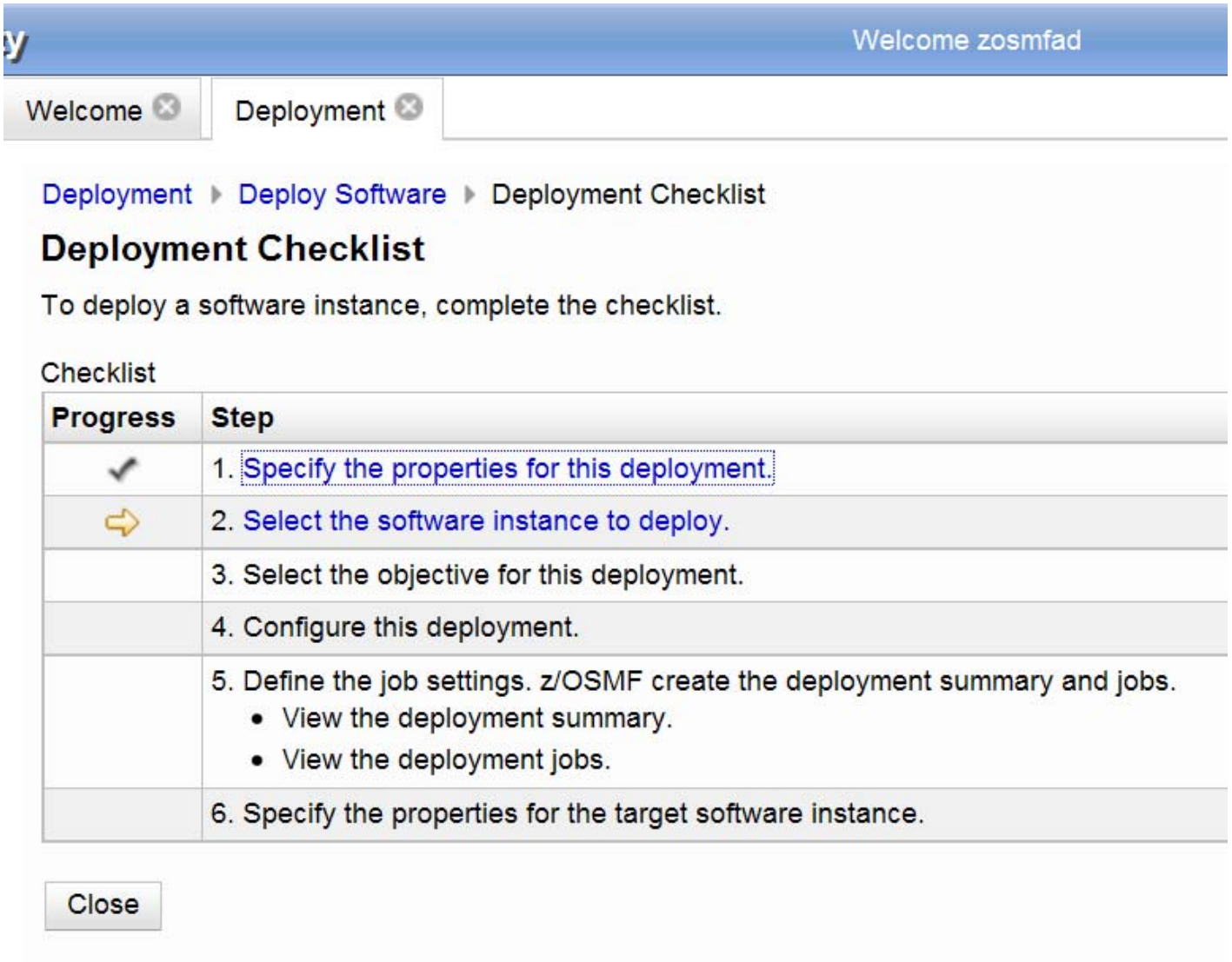
Deploy Software Wizard



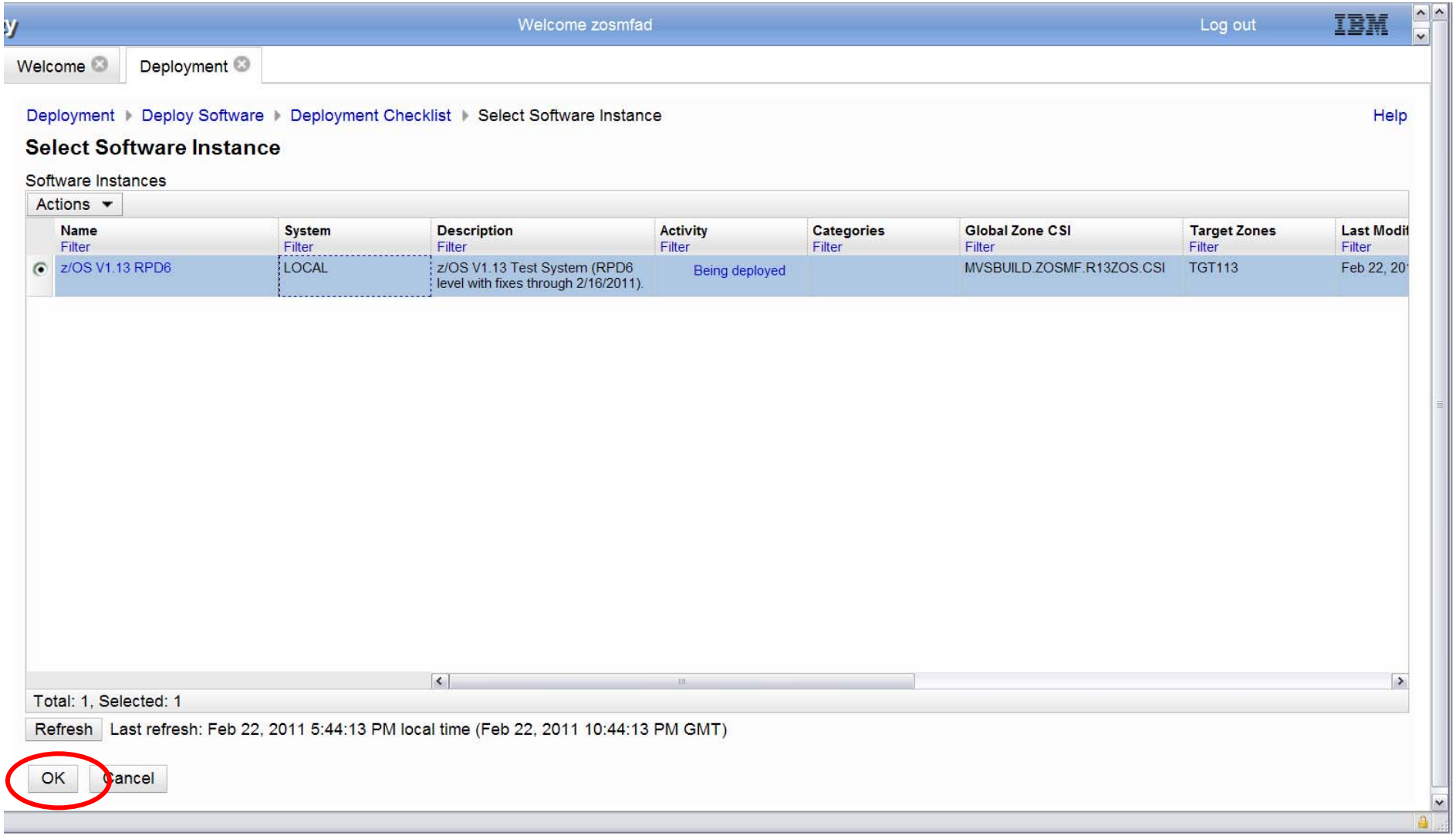
Specify Deployment Properties



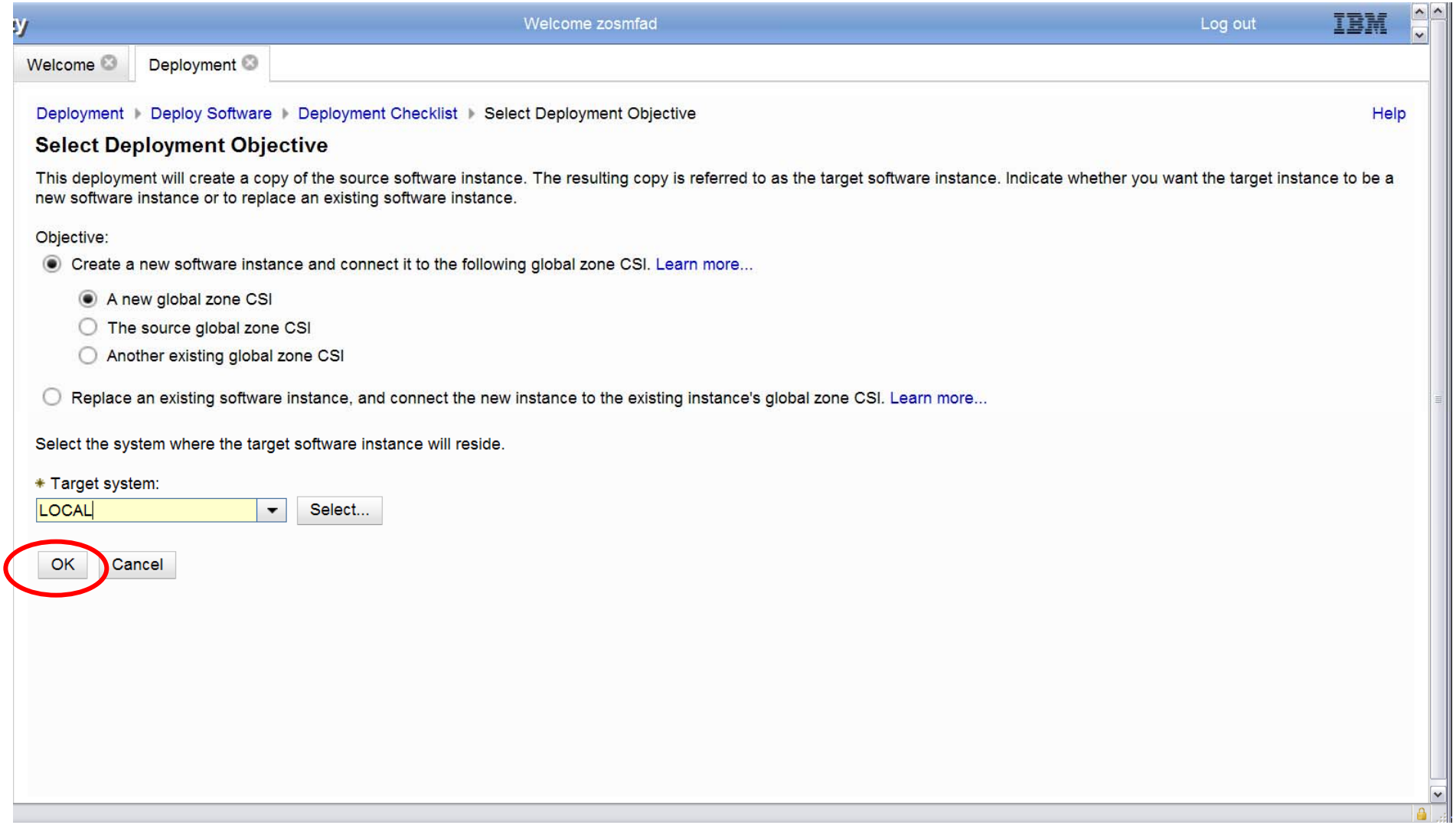
Deployment Checklist Progression



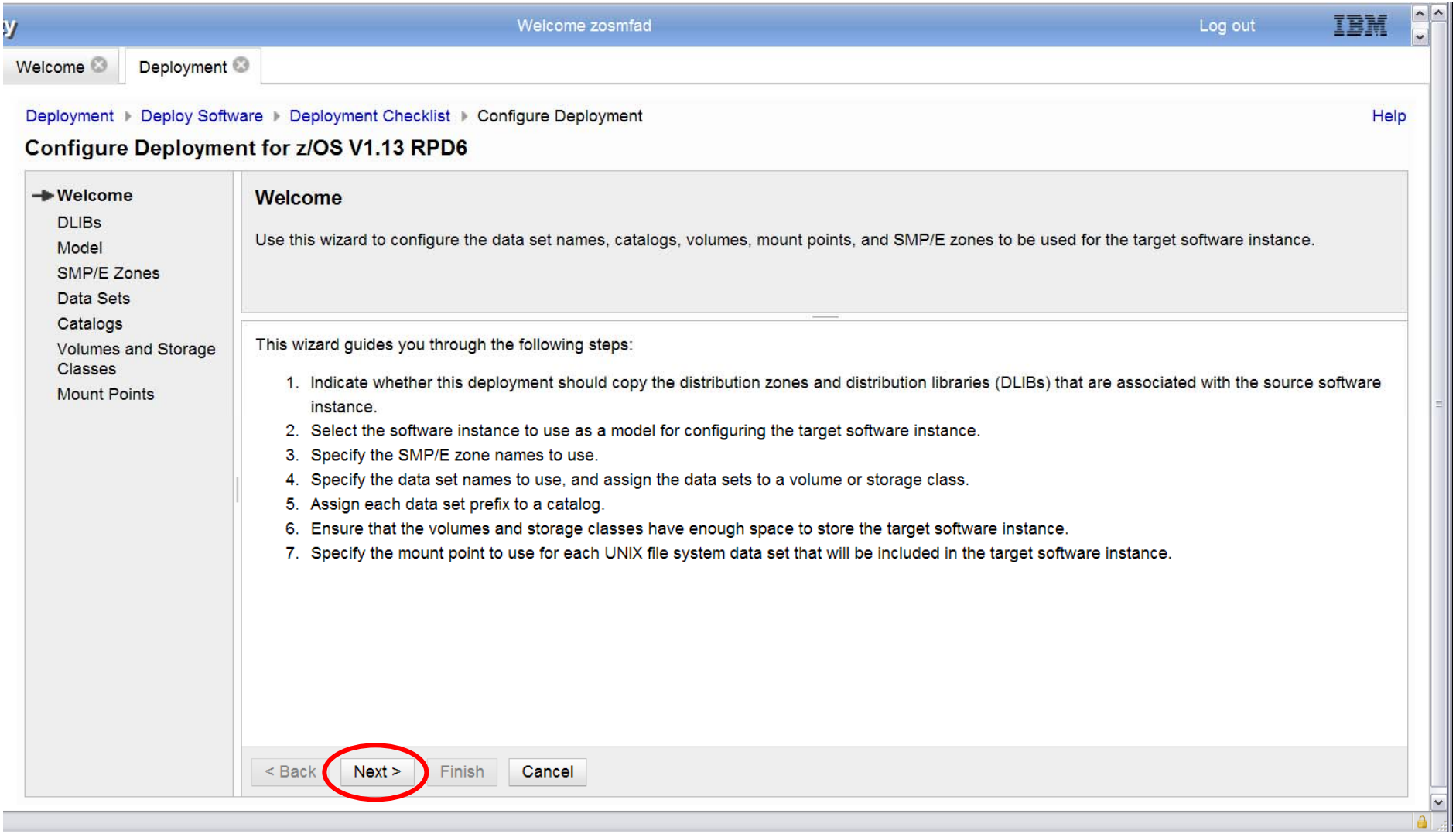
Select Software Instance



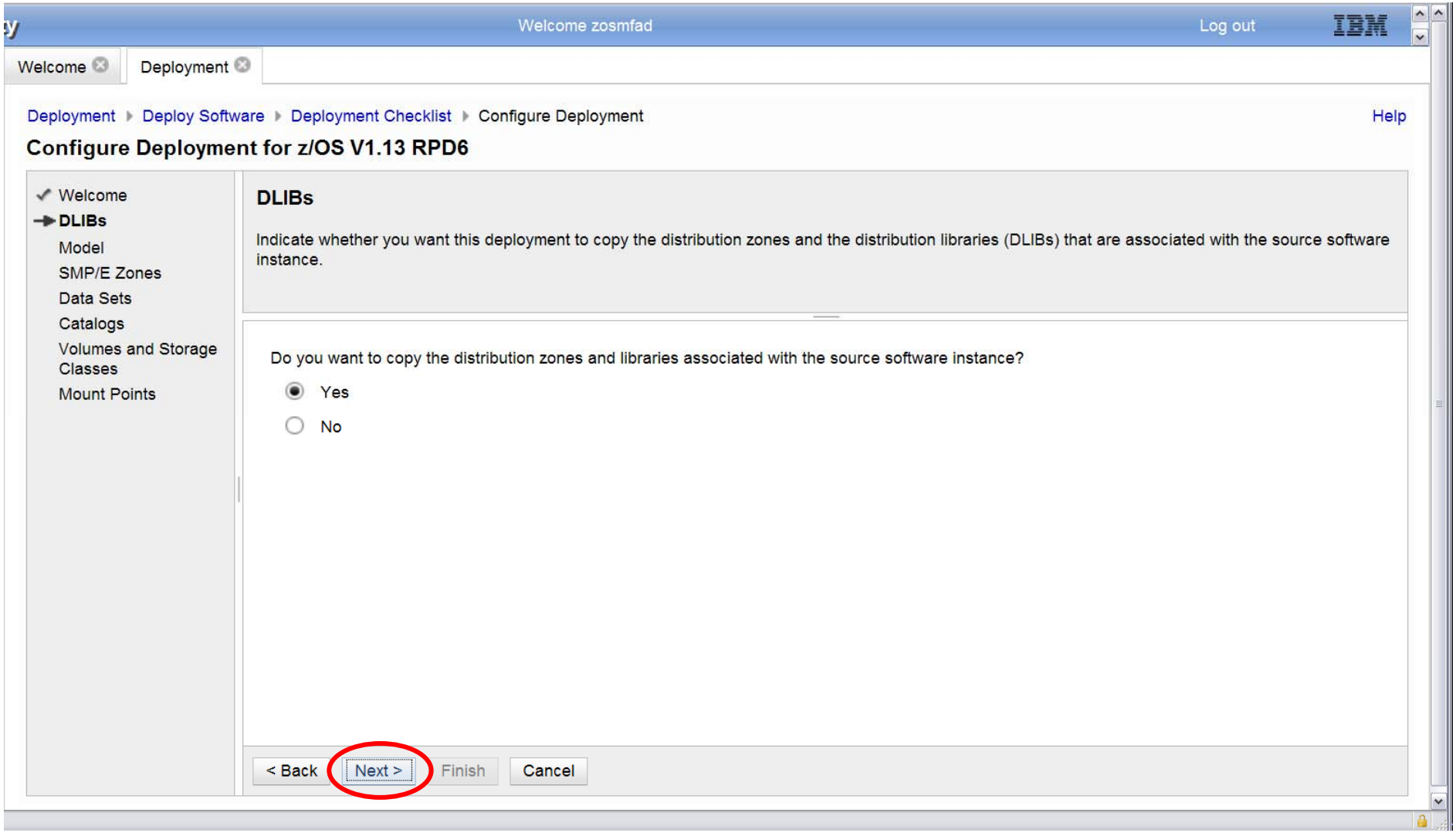
Select Deployment Objective



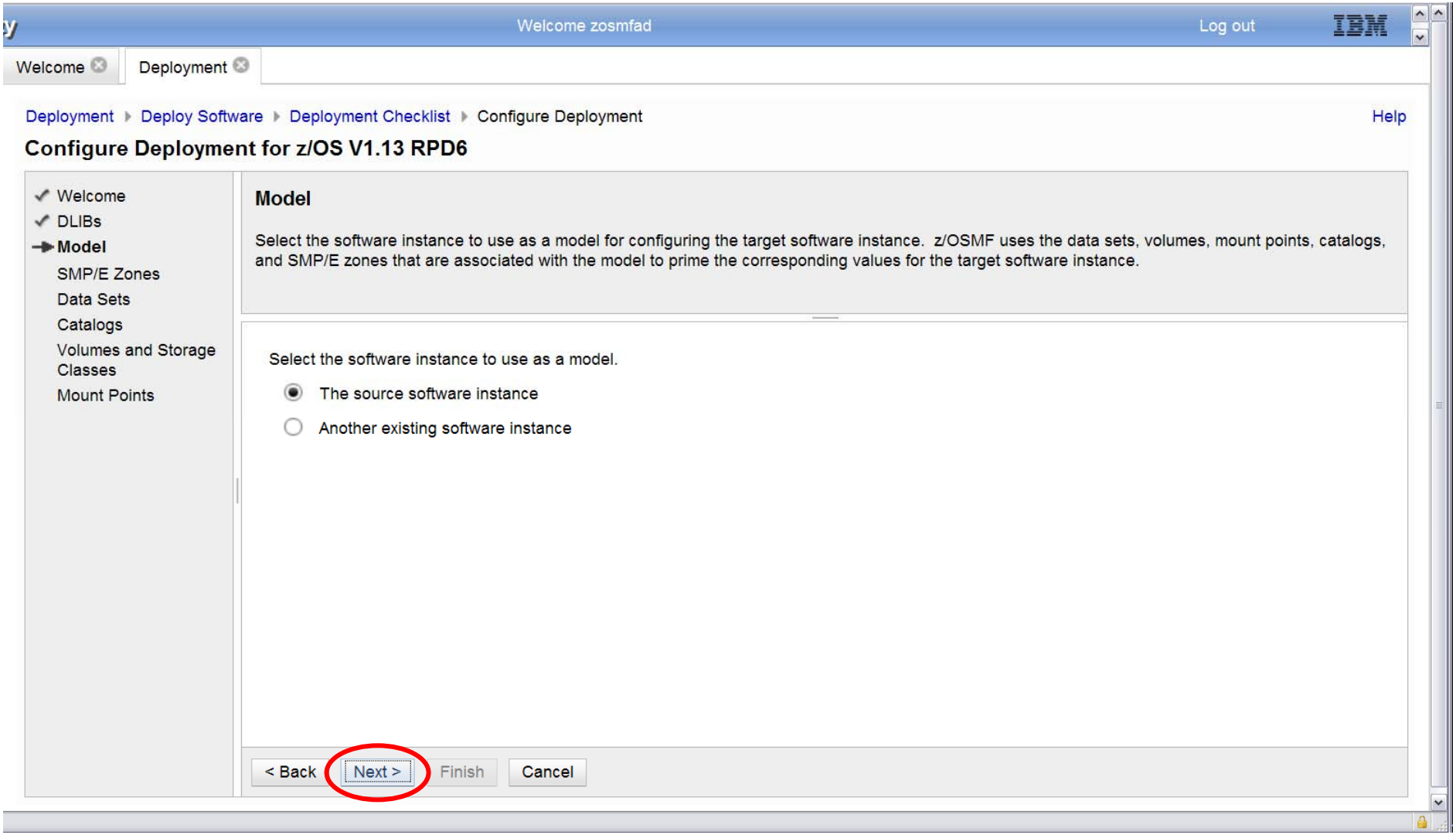
Configure Deployment Wizard



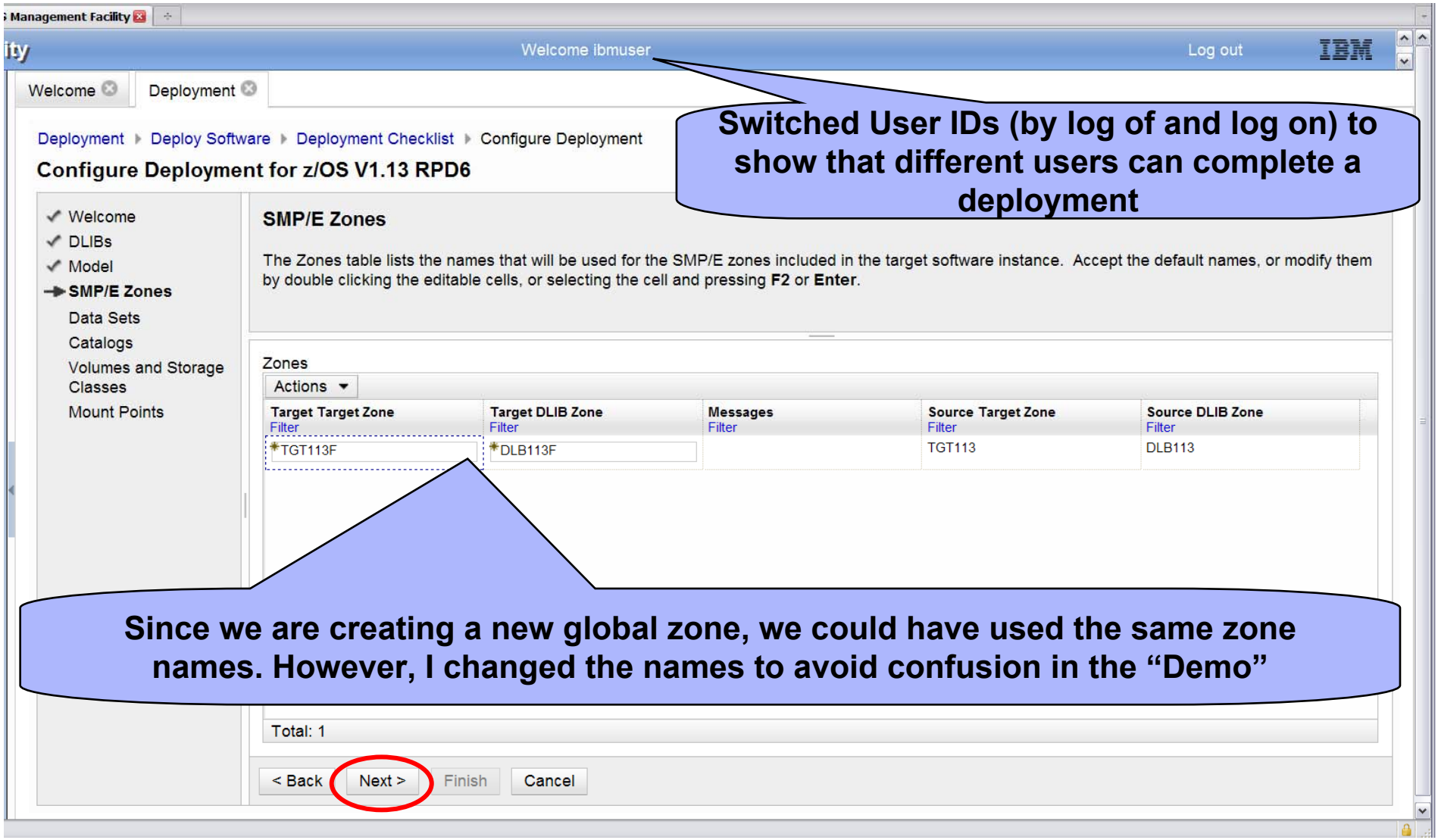
Copy DLIBs?



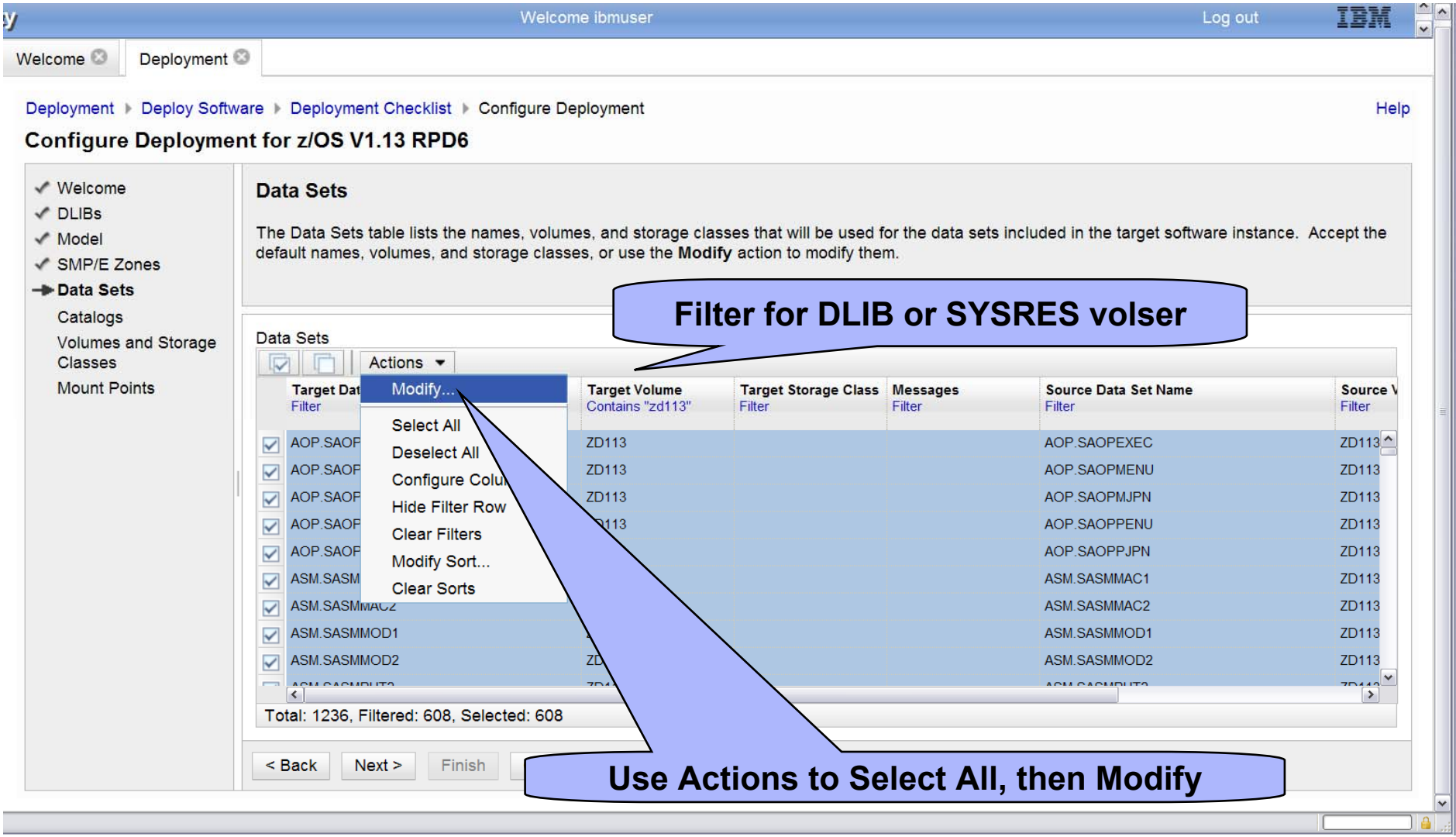
Software Instance to use as a Model



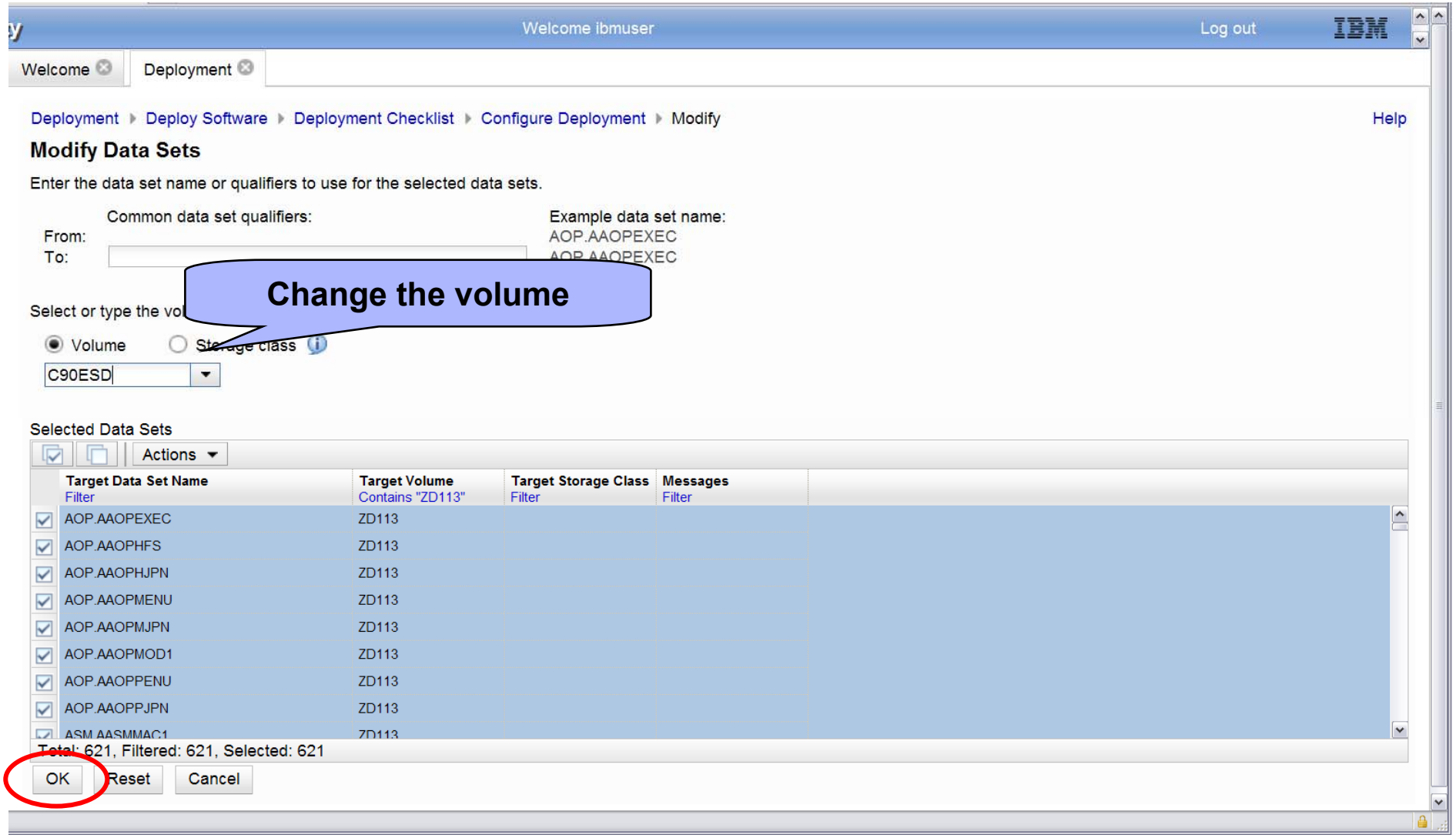
Configure Target Instance SMP/E Zone Names



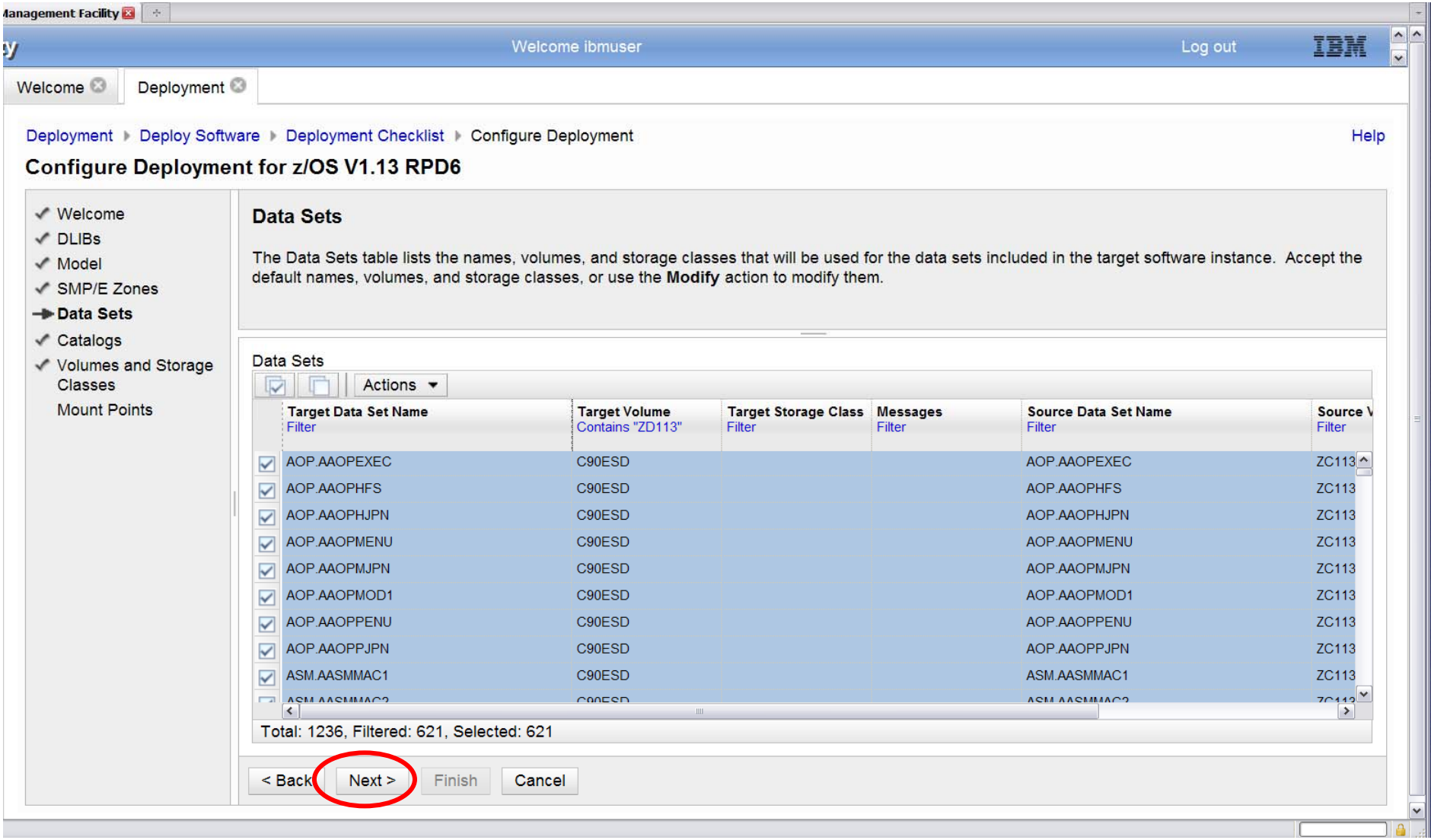
Configure Target Instance Data Sets



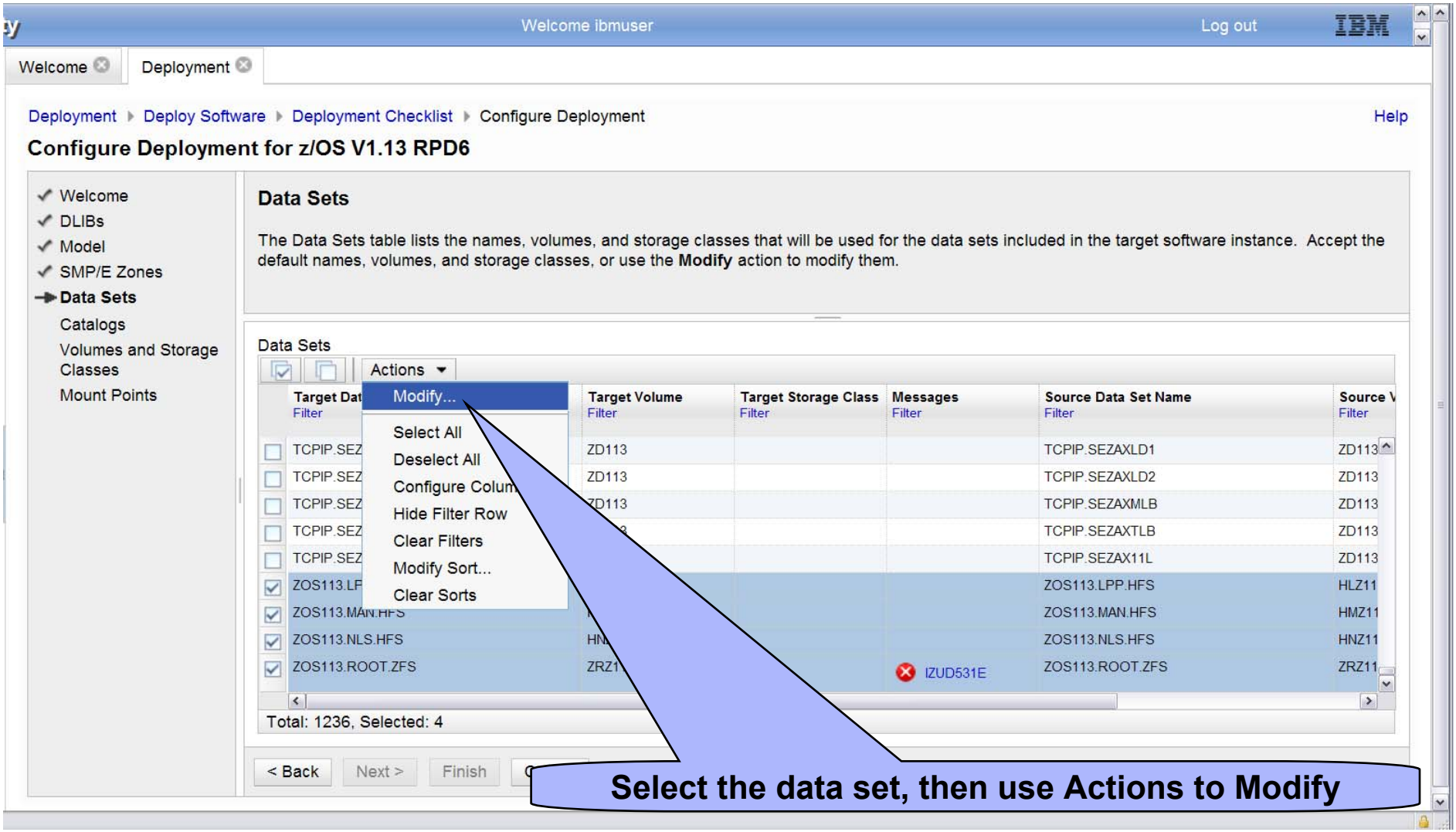
Configure Target Instance Data Sets (Volume)



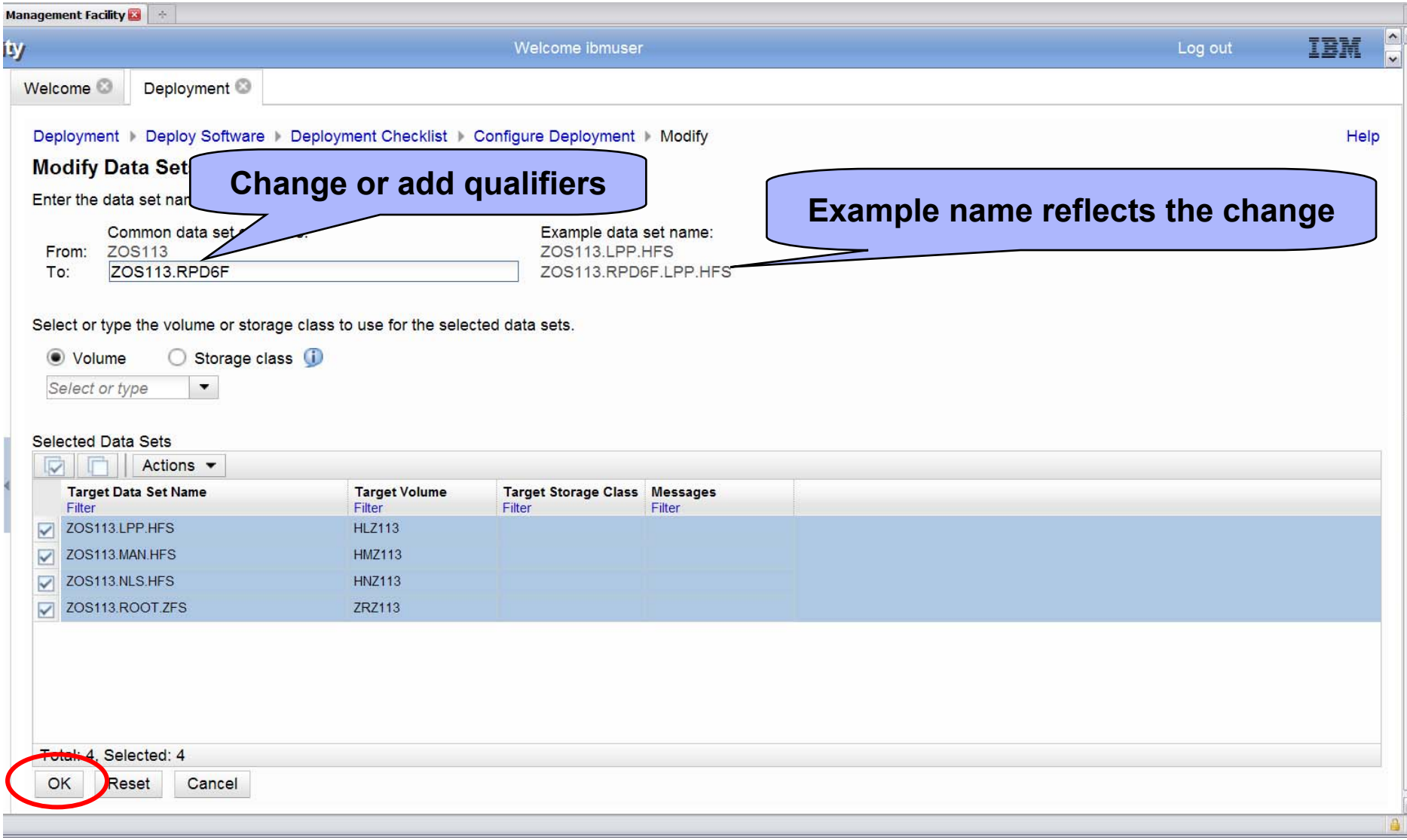
Updated Display with Changed Target Volume



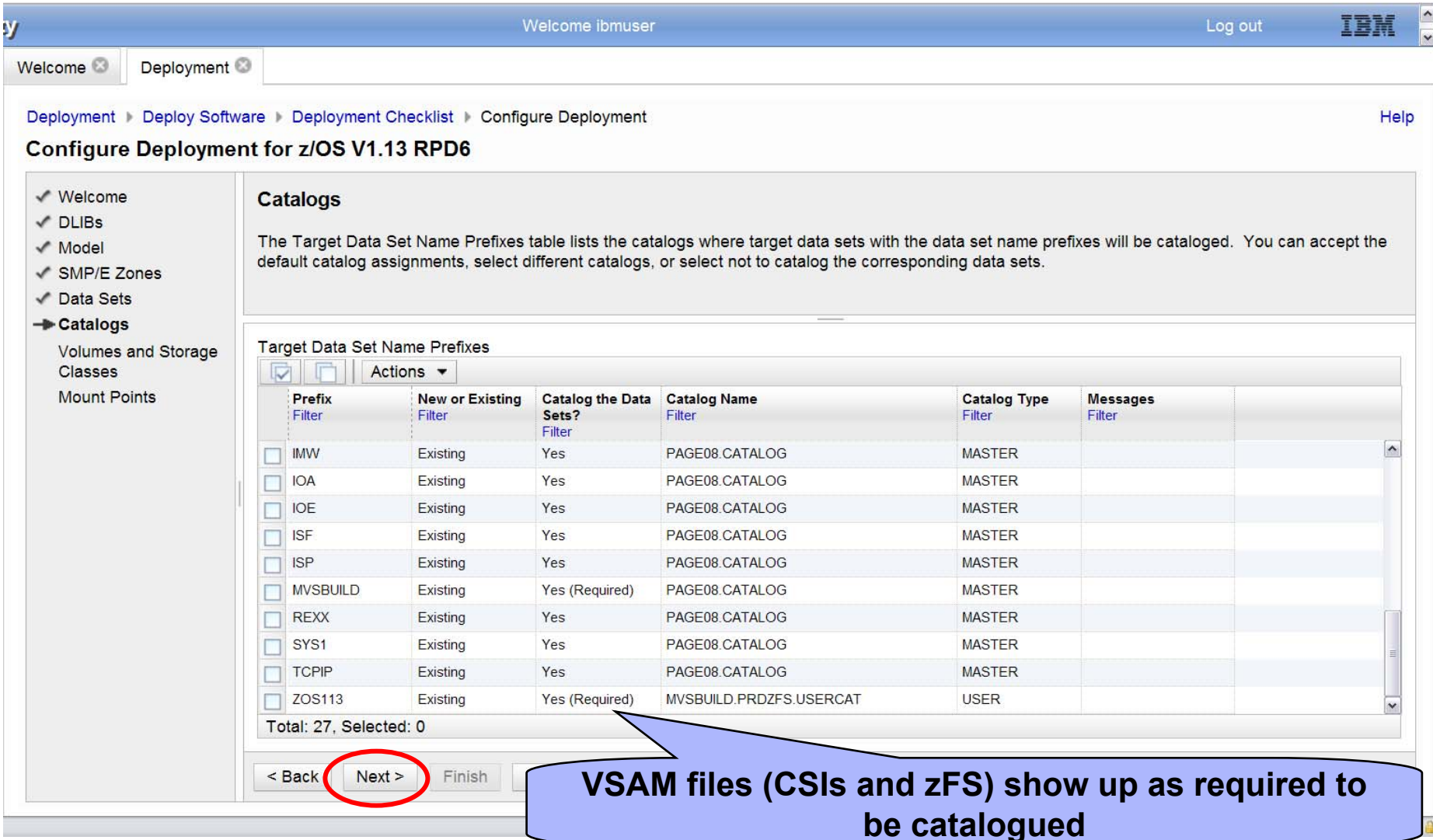
Configure Target Instance Data Sets (Names)



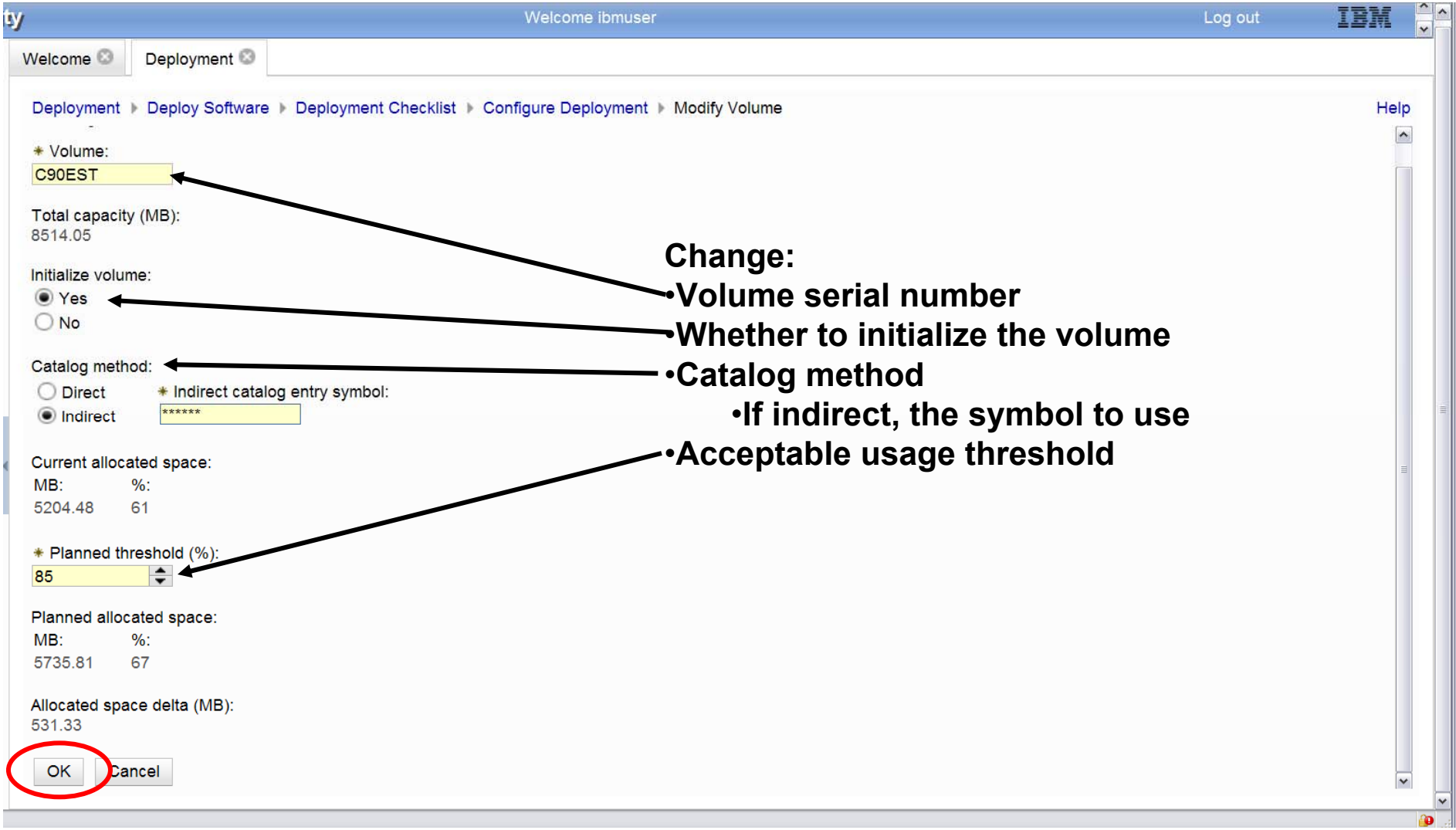
Configure Target Instance Data Sets (Names)



Configure Target Instance Catalog Environment



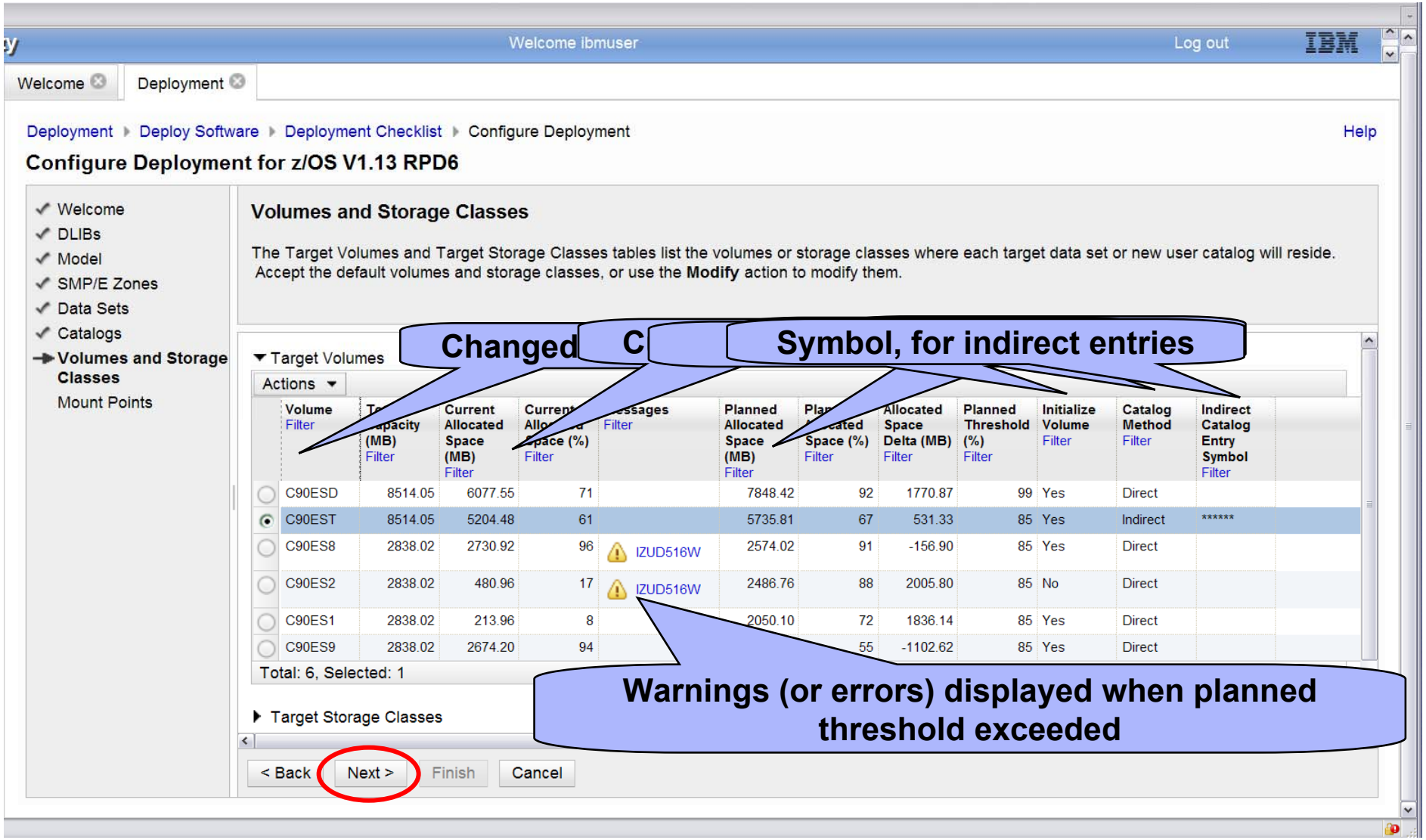
Update Target Instance Volumes



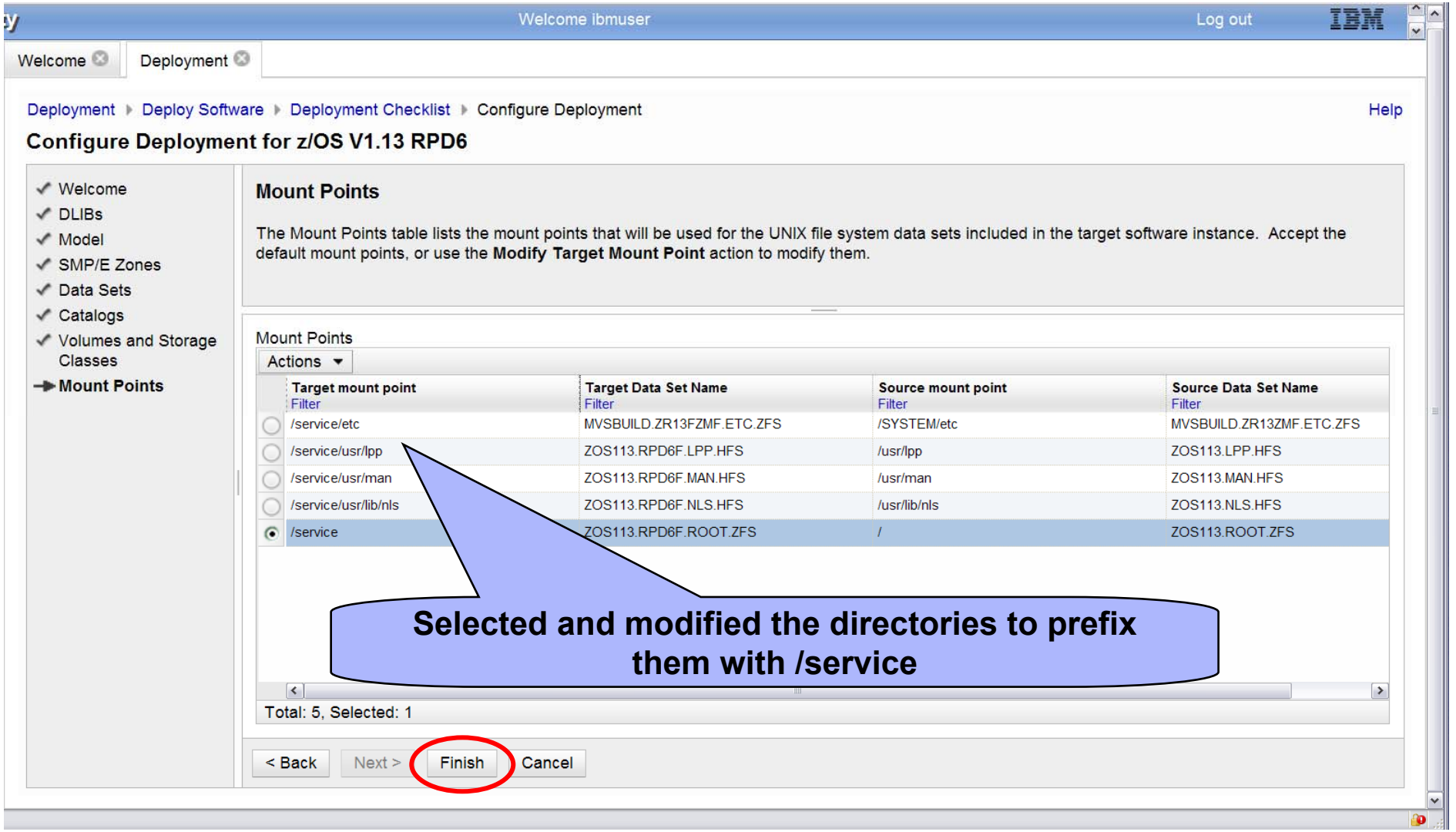
Change:

- **Volume serial number**
- **Whether to initialize the volume**
- **Catalog method**
  - **If indirect, the symbol to use**
- **Acceptable usage threshold**

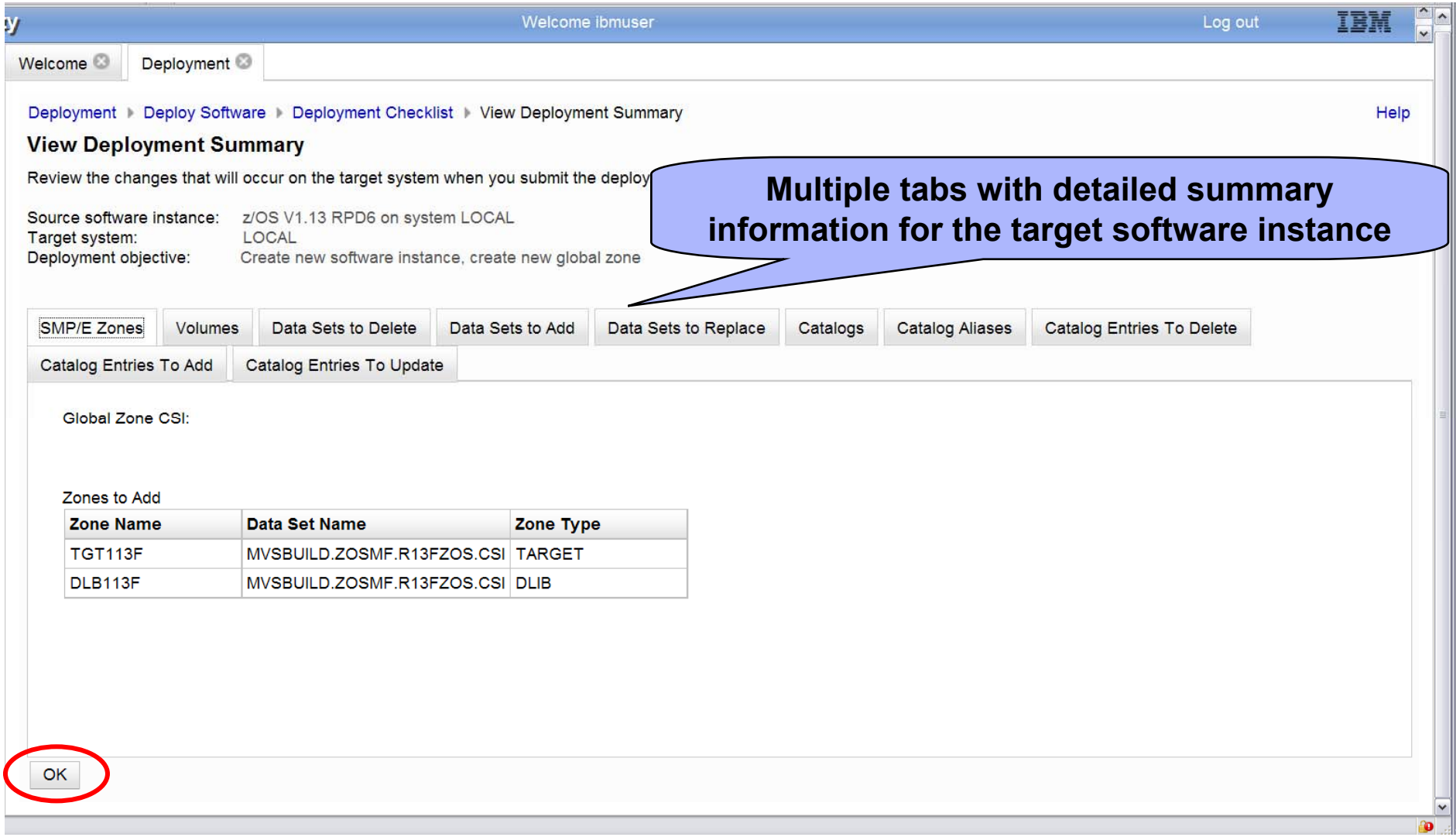
Configure Target Instance Volumes …



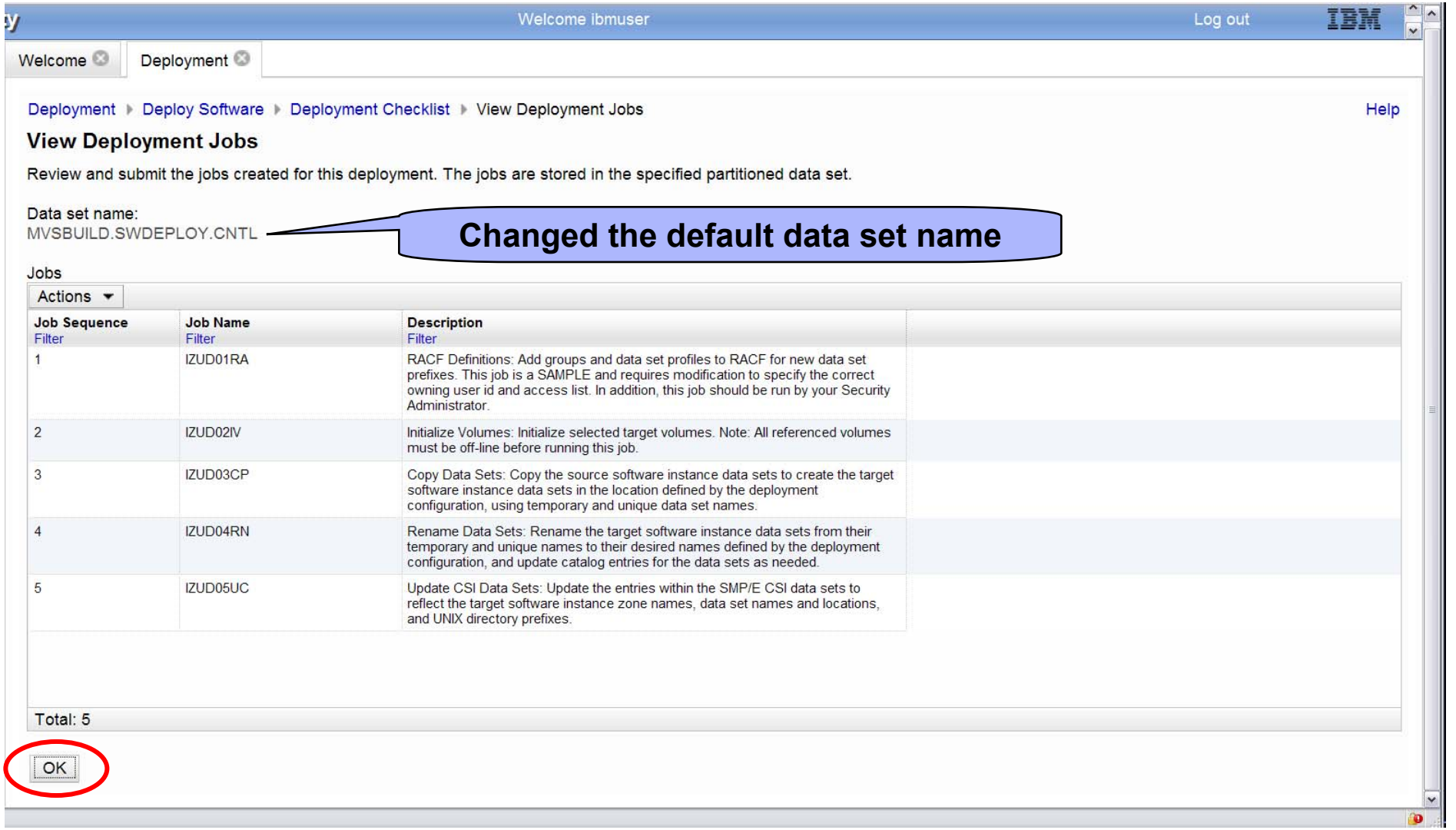
Configure Target Instance Mount Points



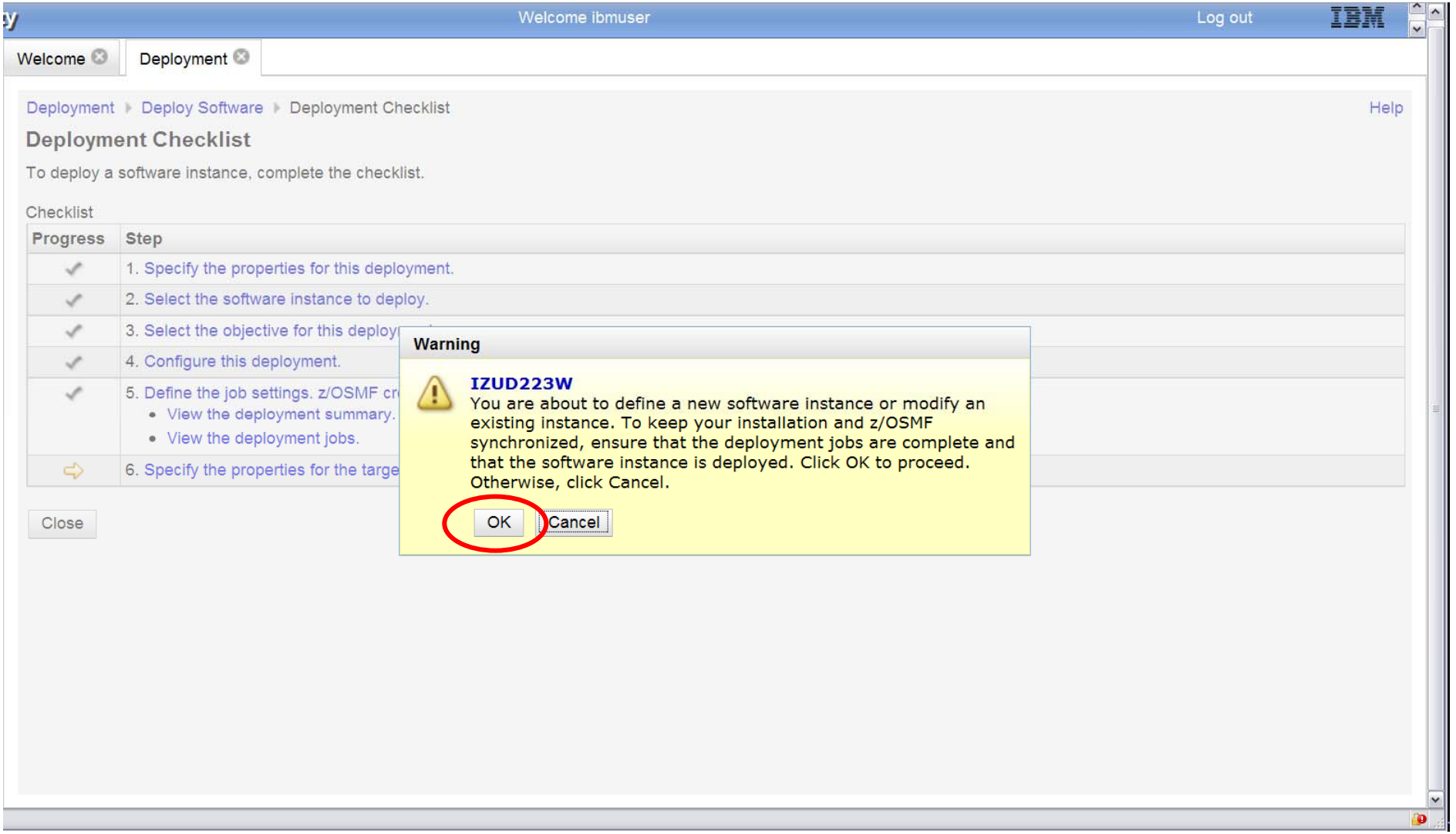
View Deployment Summary



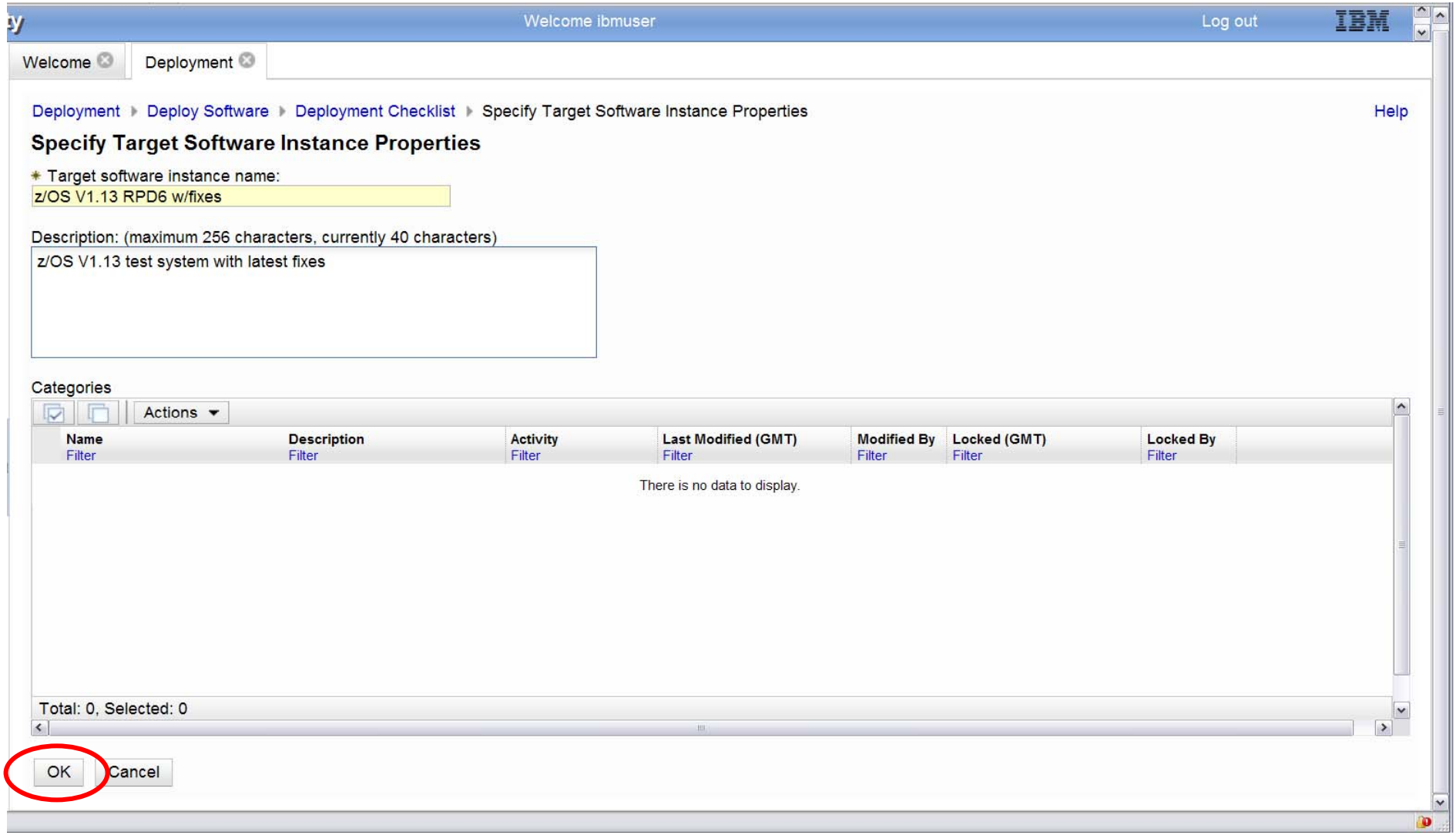
View Deployment Jobs



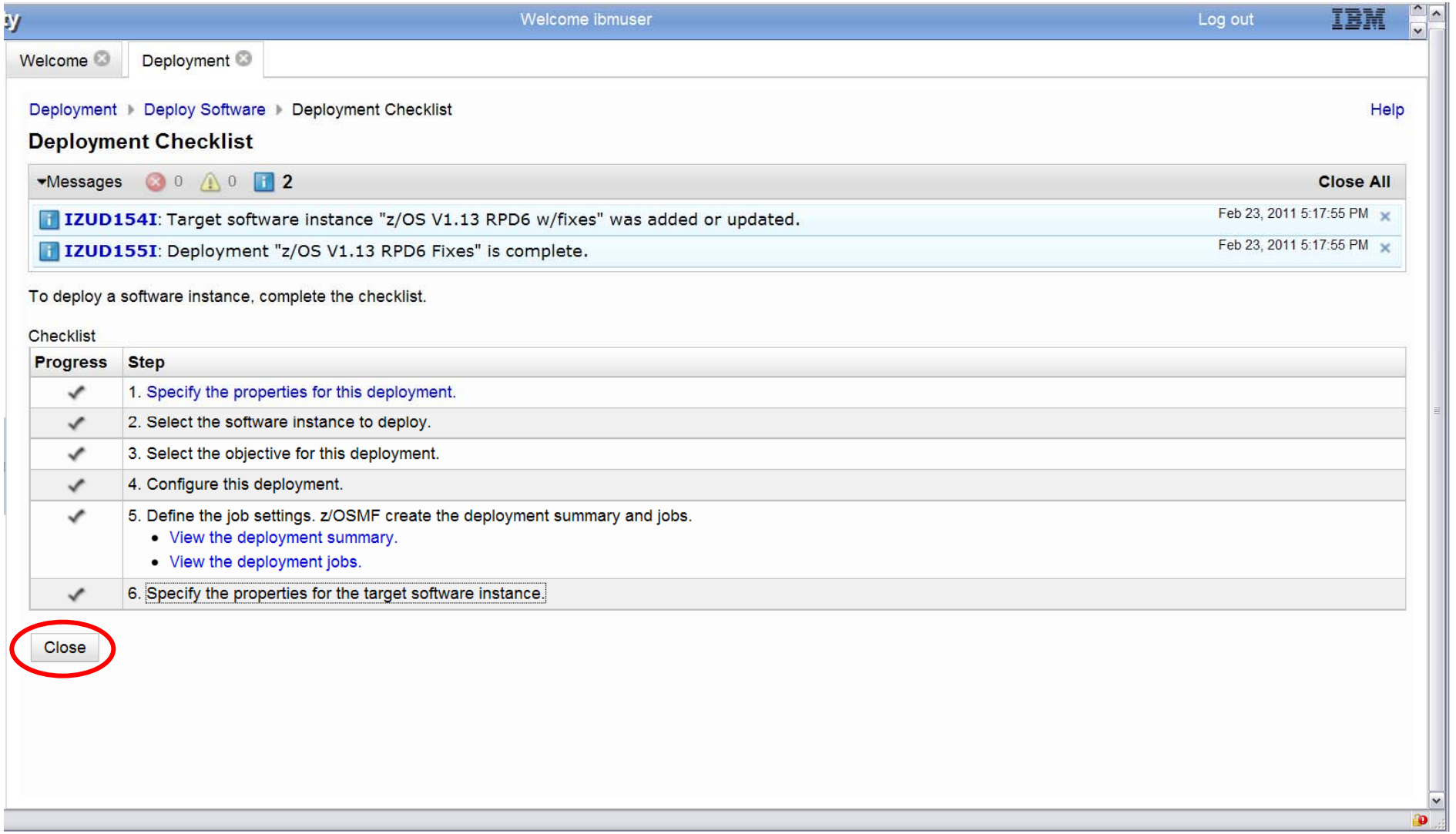
Specify the Properties of the Target Software Instance



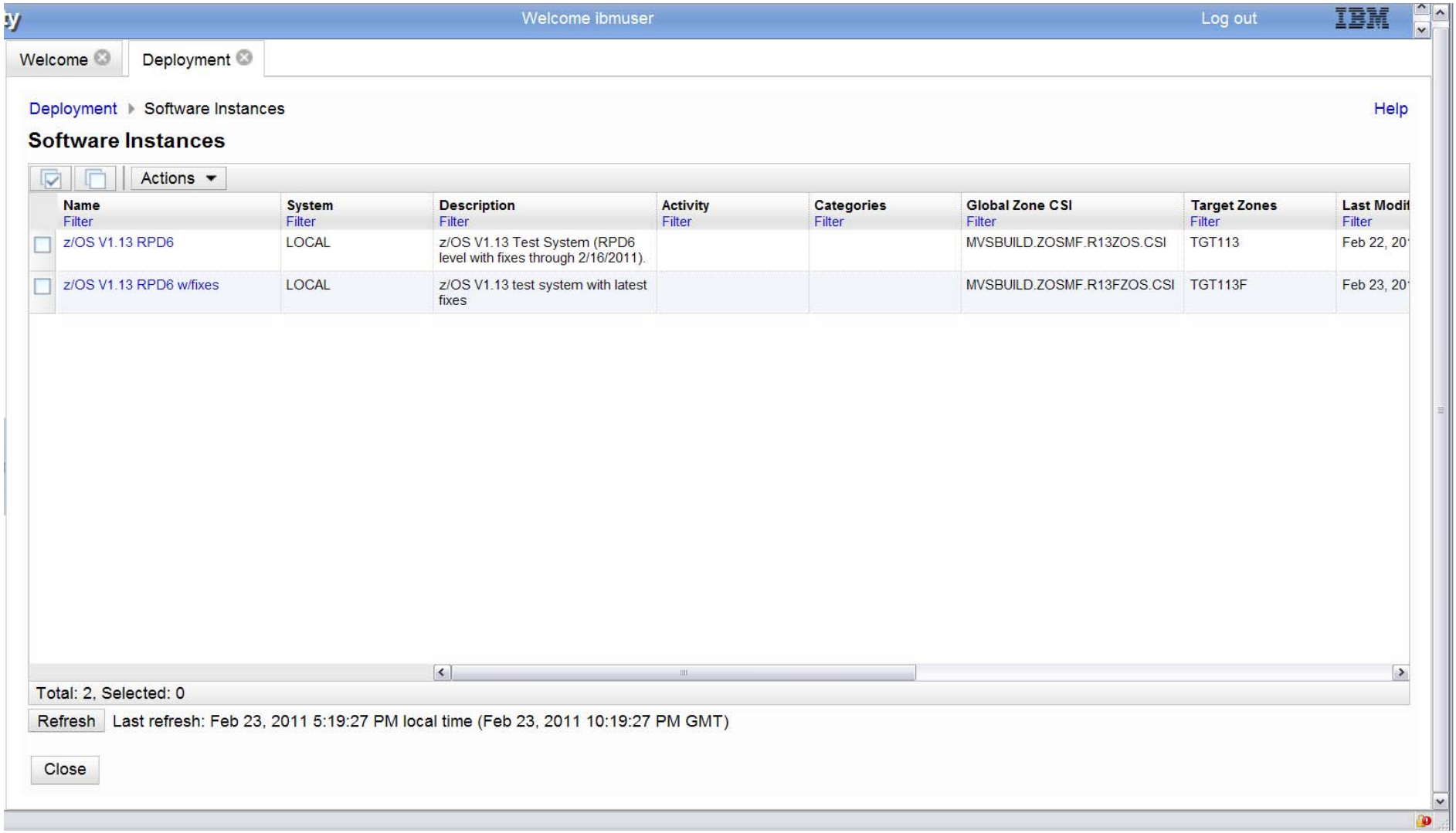
Specify the Properties of the Target Software Instance



Deployment Complete!!!



Target Software Instance Created



Summary

Summary

- **The z/OS Software Deployment function of z/OSMF will provide rigor in the deployment of *any* SMP/E installed software.**
- **It will ensure:**
  - ALL affected parts are copied
  - The zone(s) is carried forward with the software
- **It will help to ensure:**
  - Cross system requisites are satisfied (coexistence and preconditioning)
  - Cross product requisites (on the same system) are satisfied
  - Software fixes are not regressed
- **Can be used to create a clone for subsequent installation or execution.**
- **Software Deployment will save user specified information and allow for reuse**
  - Subsequent deployment operations of the same source will require little or no user input.
- **Local and Remote deployments are supported**