# IBM Director for Linux on System z

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IBM Systems

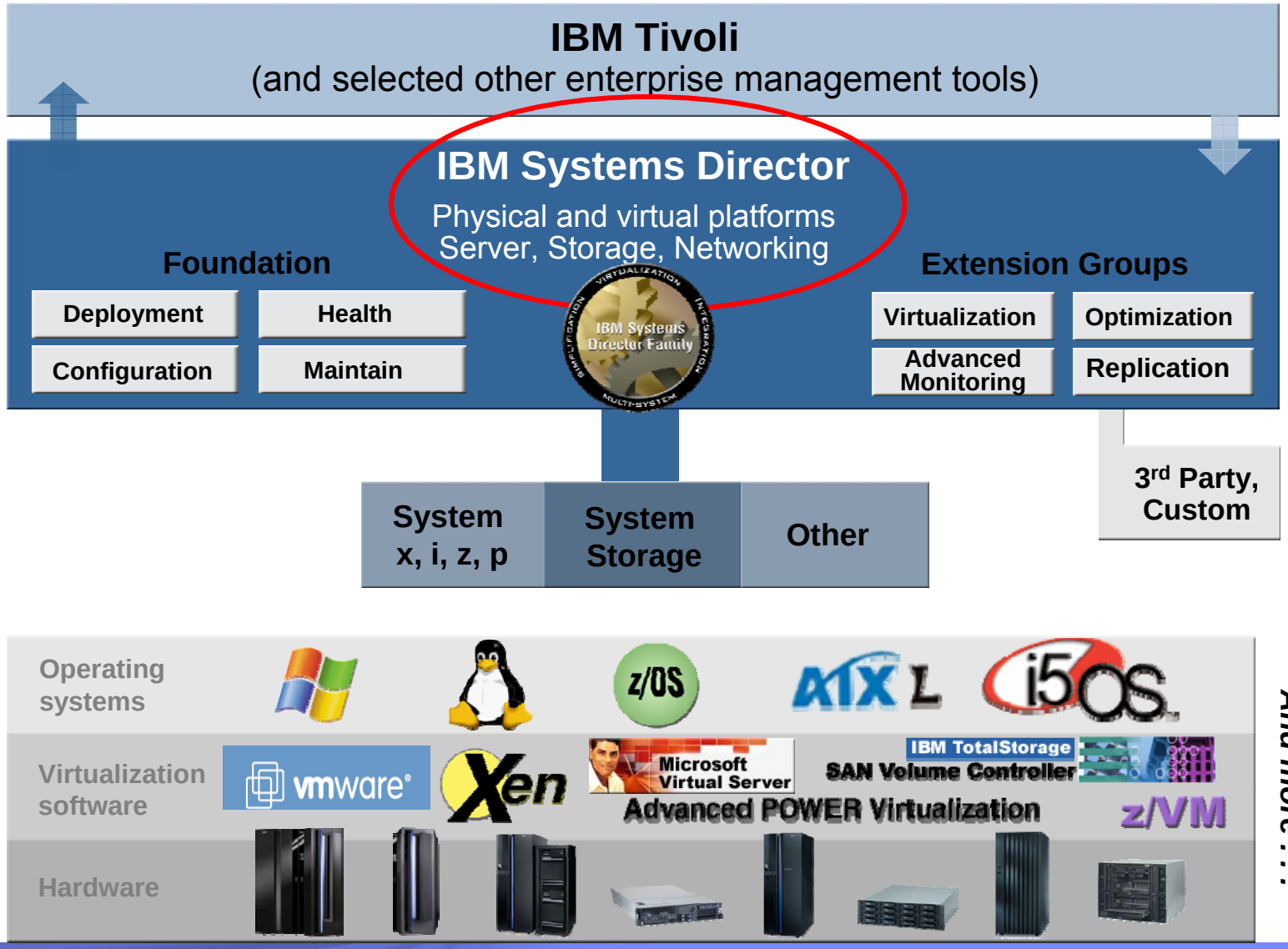
# Learning Objectives

- Understand the overall picture with the IBM Systems Director family
- Understand details of IBM Director for Linux on System z
  - Value
  - Product Overview
  - Base functions for Linux on System z
  - Topology
- Learn about IBM Director Extension: 'z/VM Center' for z/VM Linux provisioning
  - z/VM Center - Task 'Virtual Server Deployment'
  - z/VM Center - Task 'Server Complexes'
  - z/VM Center - Task 'Utility Service Configuration Manager' & Software Distribution Premium Edition
- Learn about IBM Director Extension: Software Distribution Premium Edition
- Understand positioning between IBM Director and IBM Service Management (Tivoli)

# Overall Picture

**Announcement**

**November 2, 2006**



# IBM Systems Director family - Virtualize more, manage less

- IBM's unified family of **platform management** tools for managing:
  - Physical and virtual resources together
  - Servers, storage, and networking
  - IBM and compatible non-IBM resources
- Seamless integration with IBM Service Management offerings from Tivoli®
- **Helps lower operational costs and increase productivity:**
  - Simplified management of physical and virtual infrastructure
  - Rapid deployment of IT resources
  - Reduction in time consuming management tasks

# IBM Director for Linux on System z

**IBM Director for Linux on System** is a full member of the IBM Systems Director family, delivering:

- IBM Director Server, Console and Agent to run on Linux on System z
- **Free of charge core / base functions:** discovery, inventory, monitor, alert, etc. - common to all IBM systems
- **Extensions**: z/VM Center, Software Distribution Premium Edition
- Upgrade options to Service Management solutions from Tivoli

# IBM Director for Linux on System z – Value

## Simplified administration of enterprise wide IT, including z/VM Linux systems

- Consistent tool set across IBM platforms can reduce need for system specific administration skill
- Administration of z/VM virtual guests is like for any other server

## Automation of z/VM Linux guest system deployment

- Template-based deployment of test and development systems, managed via IBM Director console GUI
- Flexible management of z/VM virtual servers based on industry CIM (Common Information Model) standard

## Platform management with upgrade path to IBM Tivoli solutions on System z

- Easy start – start with one product only to get the basic systems management functions
- Grow into comprehensive IBM Service Management solutions like IBM Tivoli Monitoring (ITM) and OMEGAMON®

# Product Overview

### IBM Director base functions for Linux on System z

- Discovery
- Group Management
- Inventory
- Basic Resource Monitor
- Event Action Plan
- Process Management
- Remote Session
- File Transfer
- Network Configuration
- Software Distribution
- SNMP Browser

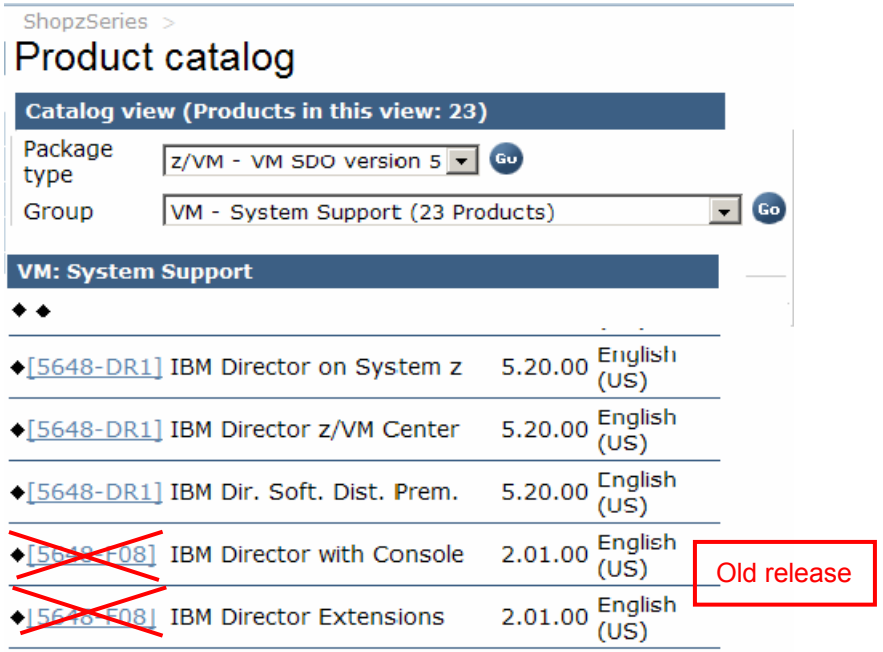
### z/VM Center

- Utility Service Configuration Manager
- z/VM Virtual Server Deployment
- z/VM Server Complexes

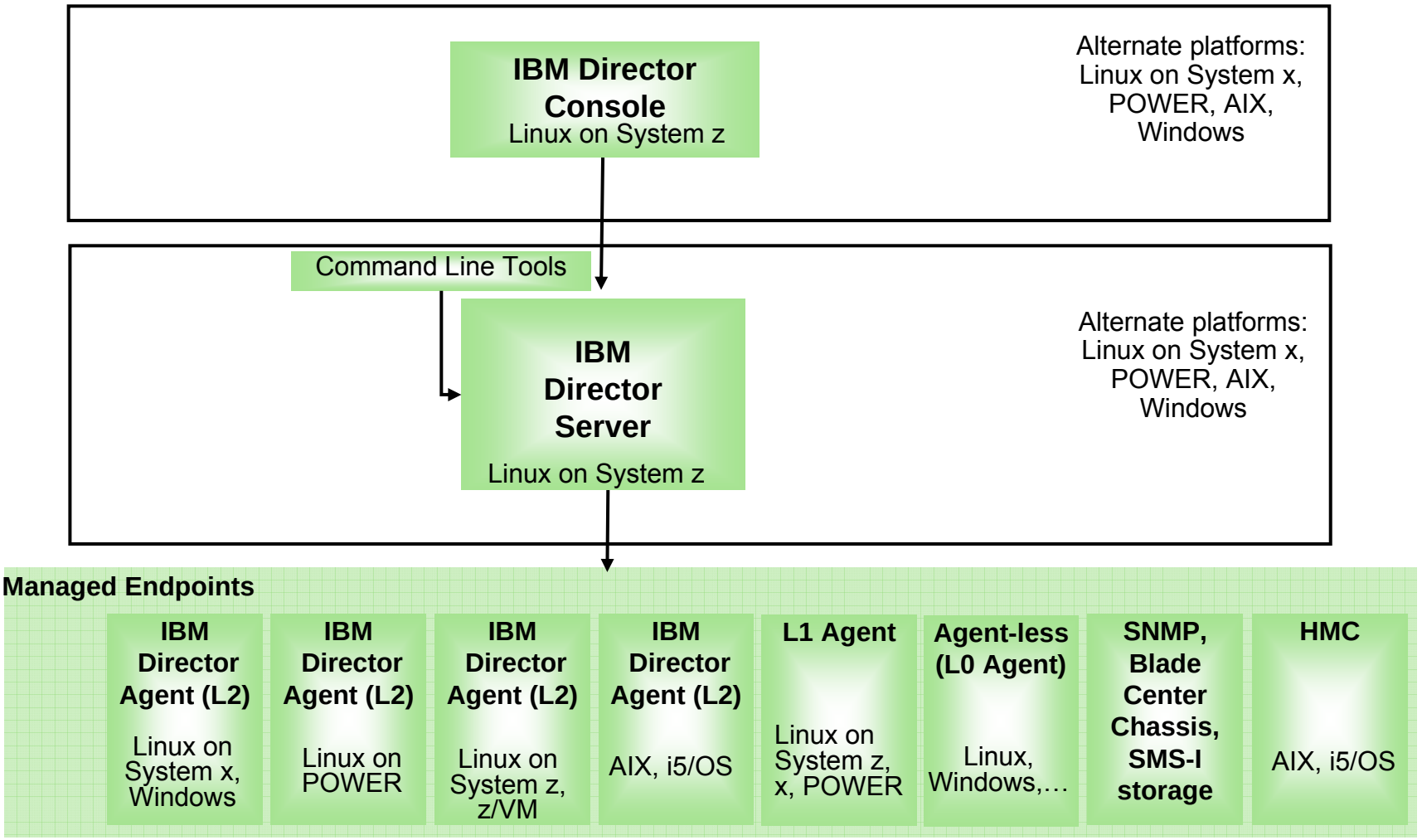
### Software Distribution Premium Edition

- SW package distribution

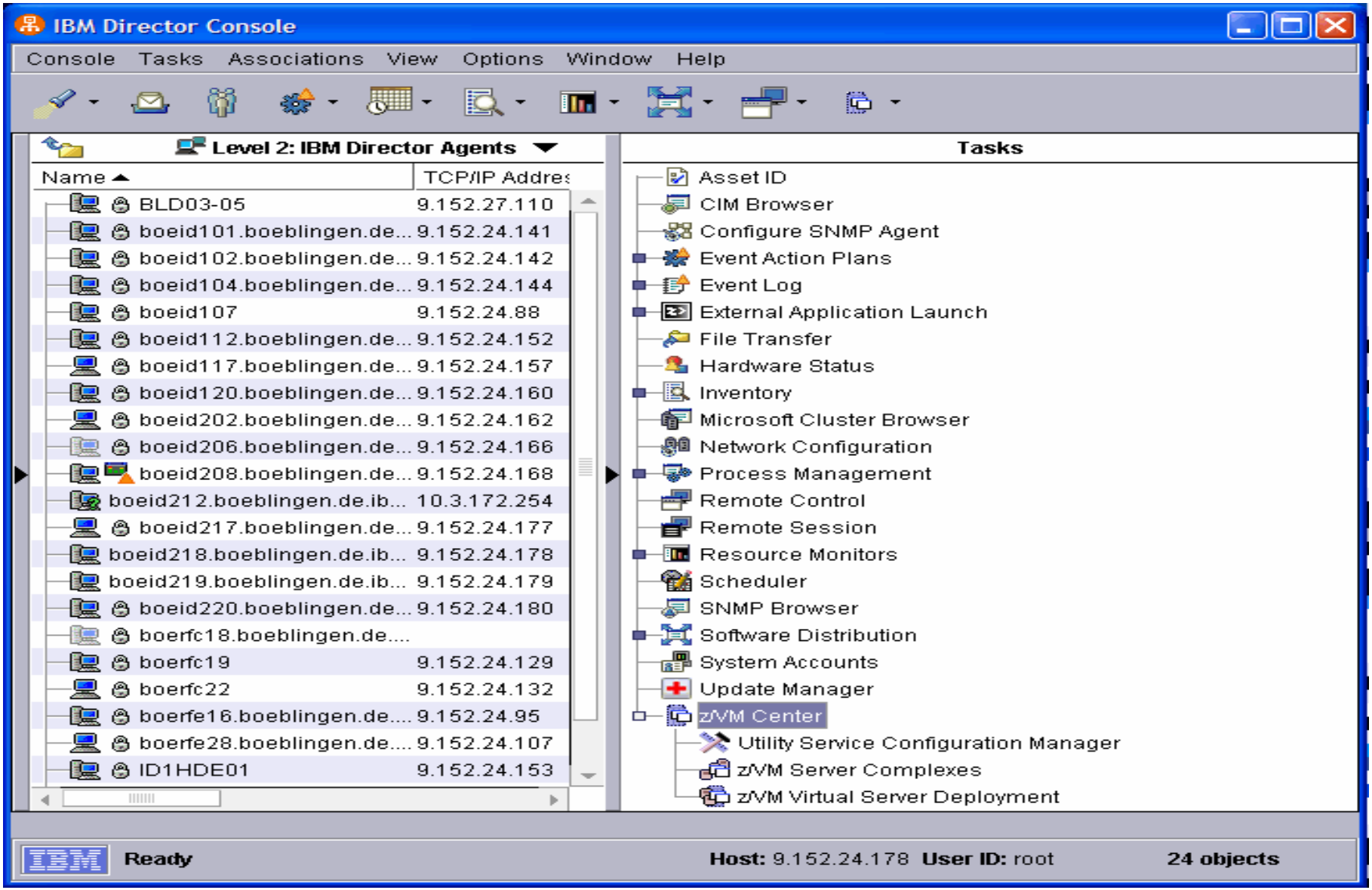
| IBM Director for Linux on System z, Version 5.2 - PID: 5648-DR1 | |
|---|---|
| Base | **IBM Director** |
| Feature | **IBM Director z/VM Center** |
| Feature | **IBM Director Software Distribution Premium Edition** |
| **Ordering:** www14.software.ibm.com/webapp/ShopzSeries/ShopzSeries.jsp | |



# IBM Director - Topology



# IBM Director - Console



# Base Management – Linux on System z

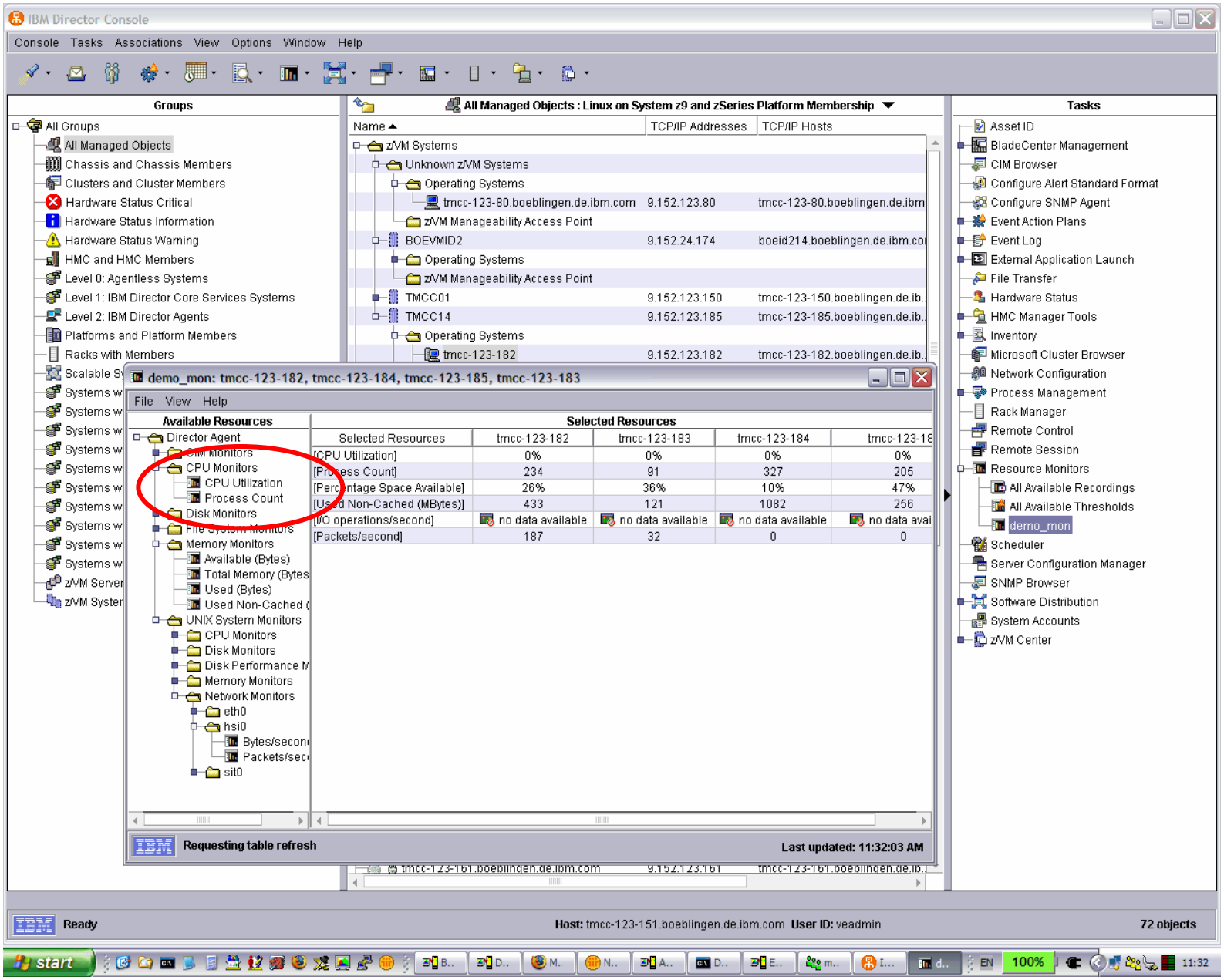
| **Supported Operating System** | |
|---|---|
| Linux on zSeries | Red Hat Enterprise Linux AS, Version 4.0<br>Novell SUSE Linux Enterprise Server 9 (Service Pack 2) & 10 |
| **Supported Task** | |
| Discovery | Discovery of managed systems (agent-less system [level 0]), systems with core services (level 1), IBM Director agents (level 2) (incl. z/VM), SNMP agents, and more – see topology overview |
| Group Management | Create and manage dynamic and static groups of systems in order to get control over discovered systems (e.g., to apply IBM Director task to groups) - z/VM Systems and z/VM Server Complexes groups are provided |
| Inventory | Inventory (SW, HW fixes,…) of discovered systems |
| Resource Monitors | Define / view resource monitors for systems/ groups and set thresholds (e.g., disk, memory usage, CPU usage) |
| Event Action Plan/Log | Define event filters and associated actions for resource monitors and process monitors |
| Process Management | View/ start/ stop/ monitor processes (e.g. CPU or memory utilization); execute commands and create schedulable tasks (e.g. cleanup or backup process) |

# Base Management – Linux on System z

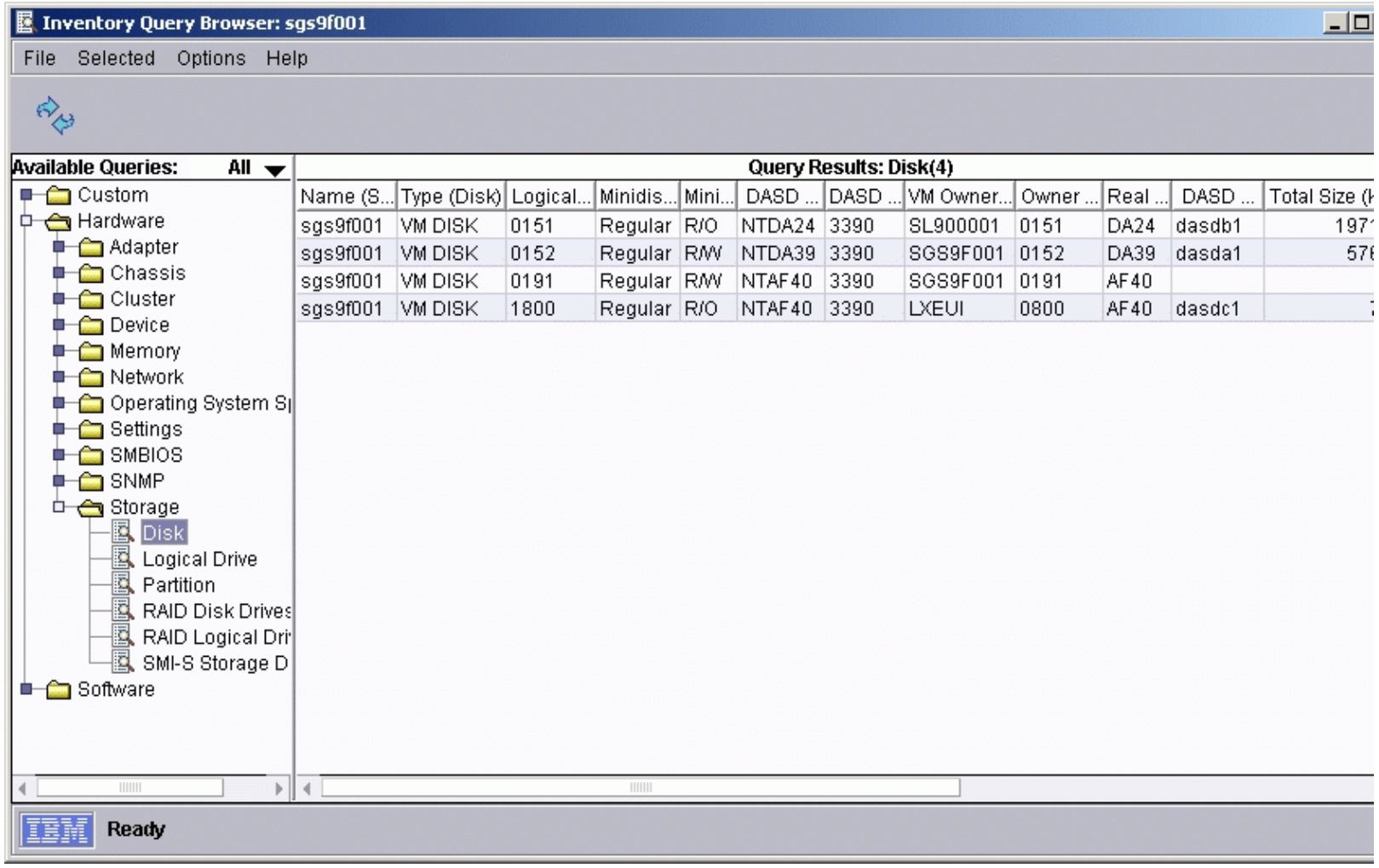
| Supported Task | |
|---|---|
| Remote Session | Establish command line sessions (ssh/telnet) with remote system |
| File Transfer | Transfer files between management server and managed systems (e.g., to synchronize files, directories, configurations) |
| CIM Browser | Plain browsing through CIMOM of CIM instrumentation on managed system |
| SNMP Browser | View SNMP information and set SNMP attributes |
| Scheduler | Schedule and monitor non-interactive management tasks (e.g. Backup process) |
| Network Configuration | Information about the network configuration |
| System Accounts | Management of Linux User IDs on managed systems (create / change User IDs and passwords, manage groups, expiration settings….) |
| Software Distribution | Deployment of RPMs for IBM Director agents into Linux systems or groups<br>- New with V5.20: Software Distribution Premium Edition |

# Overview of Inventory Collected by System

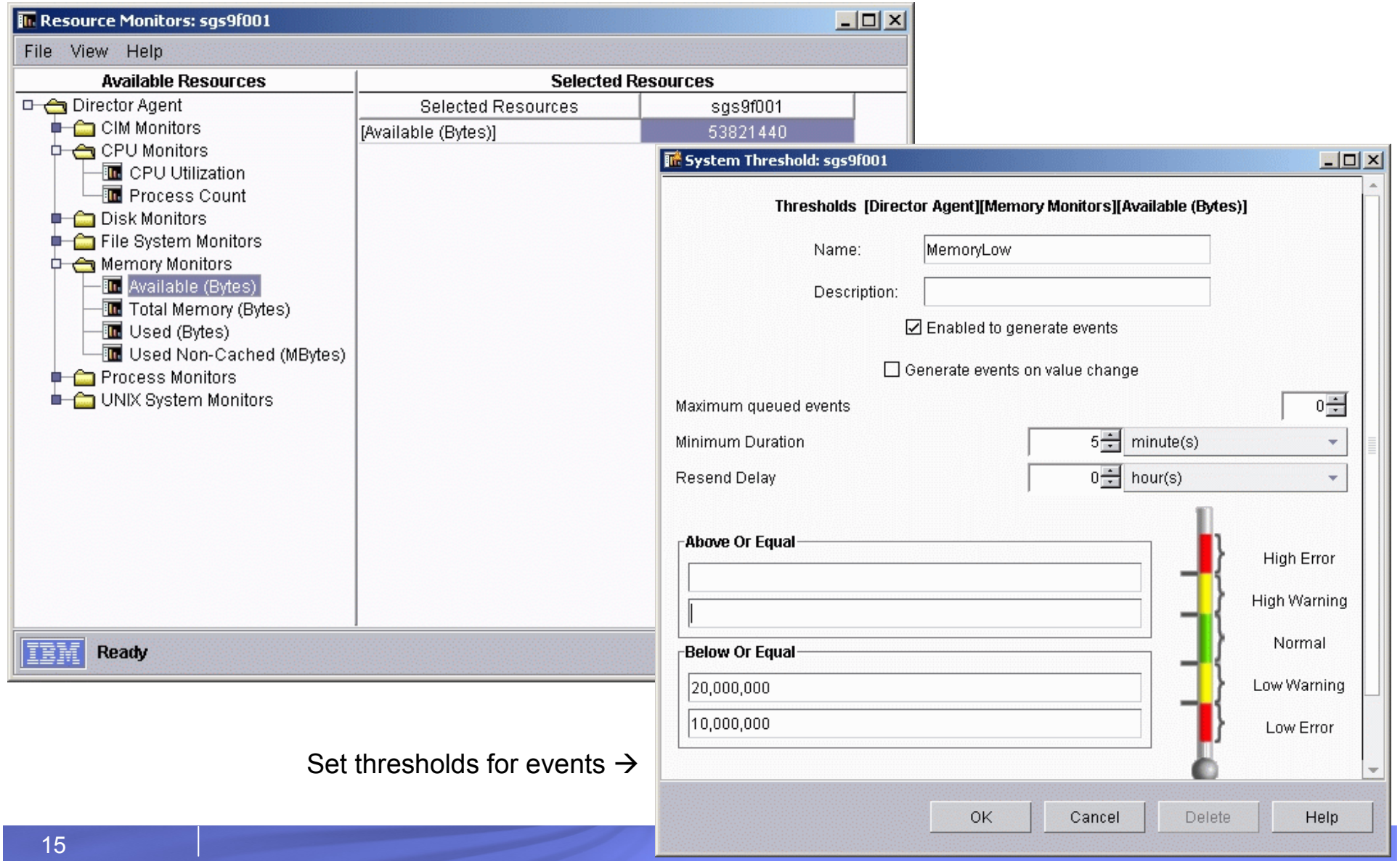
| Director Inventory Query | Linux/Windows, System x | Linux System i, p | Linux System z | AIX, I5/OS |
|---|---|---|---|---|
| **Base Inventory via operating system:**<br>**•Disk and Logical Drive**<br>**•Installed Memory, Processor**<br>**•Installed Patches and Packages**<br>**•Network Adapter & IP Address**<br>**•Operating System/System Information**<br>**•Physical Enclosure** | Yes | Yes | Yes | Yes |
| **SNMP Agent Configuration** | Yes | Yes | No | No |
| **Serial Number Information** | Yes | Yes | Yes | Yes |
| **Asset ID/Personalized Data** | Yes | Yes | No | Yes (no AssetID) |
| **Lease/Warranty Information** | Yes | N/A | N/A | N/A |
| **FRU Service Numbers** | Yes | Yes | N/A | Yes |
| **Memory Modules** | Yes | No | No | No |
| **Firmware** | Yes | Yes | N/A | No |
| **BIOS Details** | Yes | N/A | N/A | N/A |
| **Processor Details** | Yes | Yes | Yes | No |
| **System Board Configuration** | Yes | Yes | N/A | Yes |
| **Cache** | Yes | No | No | No |
| **Port Connectors** | Yes | Yes | No | No |
| **Partition, Geographic Information** | Yes | Yes | No | Yes |


IBM Director Console
Console Tasks Associations View Options Window Help
Groups
All Groups
All Managed Objects
Chassis and Chassis Members
Clusters and Cluster Members
Hardware Status Critical
Hardware Status Information
Hardware Status Warning
HMC and HMC Members
Level 0: Agentless Systems
Level 1: IBM Director Core Services Systems
Level 2: IBM Director Agents
Platforms and Platform Members
Racks with Members
All Managed Objects : Linux on System z9 and zSeries Platform Membership
Name
TCP/IP Addresses
TCP/IP Hosts
z/VM Systems
Unknown z/VM Systems
Operating Systems
tmcc-123-80.boeblingen.de.ibm.com 9.152.123.80 tmcc-123-80.boeblingen.de.ibm
z/VM Manageability Access Point
BOEVMID2 9.152.24.174
Operating Systems
z/VM Manageability Access Point
TMCC01 9.152.123.150 tmcc-123-150.boeblingen.de.ib..
TMCC14 9.152.123.185 tmcc-123-185.boeblingen.de.ib..
Operating Systems
tmcc-123-182 9.152.123.182 tmcc-123-182.boeblingen.de.ib..
demo_mon: tmcc-123-182, tmcc-123-184, tmcc-123-185, tmcc-123-183
File View Help
Available Resources
Director Agent
CPU Monitors
CPU Utilization
Process Count
Disk Monitors
Memory Monitors
Available (Bytes)
Total Memory (Bytes
Used (Bytes)
UNIX System Monitors
CPU Monitors
Disk Monitors
Memory Monitors
Network Monitors
eth0
hsi0
sit0
Selected Resources
Selected Resources tmcc-123-182 tmcc-123-183 tmcc-123-184 tmcc-123-18
[CPU Utilization] 0% 0% 0% 0%
[Process Count] 234 91 327 205
[Percentage Space Available] 26% 36% 10% 47%
[Used Non-Cached (MBytes)] 433 121 1082 256
[I/O operations/second] no data available no data available no data available no data avai
[Packets/second] 187 32 0 0
Requesting table refresh
Last updated: 11:32:03 AM
Tasks
Asset ID
BladeCenter Management
CIM Browser
Configure Alert Standard Format
Configure SNMP Agent
Event Action Plans
Event Log
External Application Launch
File Transfer
Hardware Status
HMC Manager Tools
Inventory
Microsoft Cluster Browser
Network Configuration
Process Management
Rack Manager
Remote Control
Remote Session
Resource Monitors
All Available Recordings
All Available Thresholds
demo_mon
Scheduler
Server Configuration Manager
SNMP Browser
Software Distribution
System Accounts
z/VM Center
Ready
Host: tmcc-123-151.boeblingen.de.ibm.com User ID: veadmin
72 objects
start
100%
11:32

# Base Management: Inventory



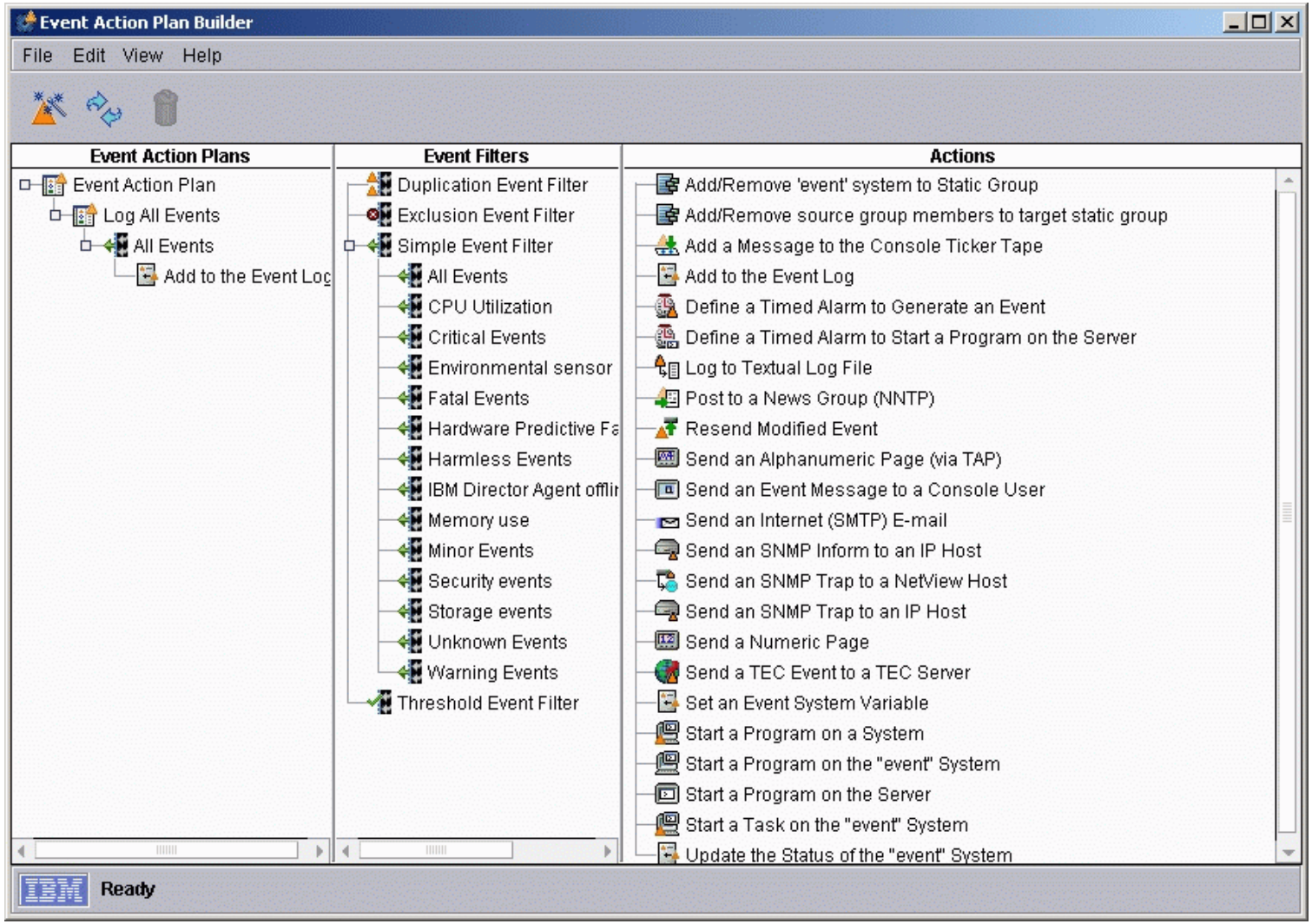
# Base Management: Resource Monitors



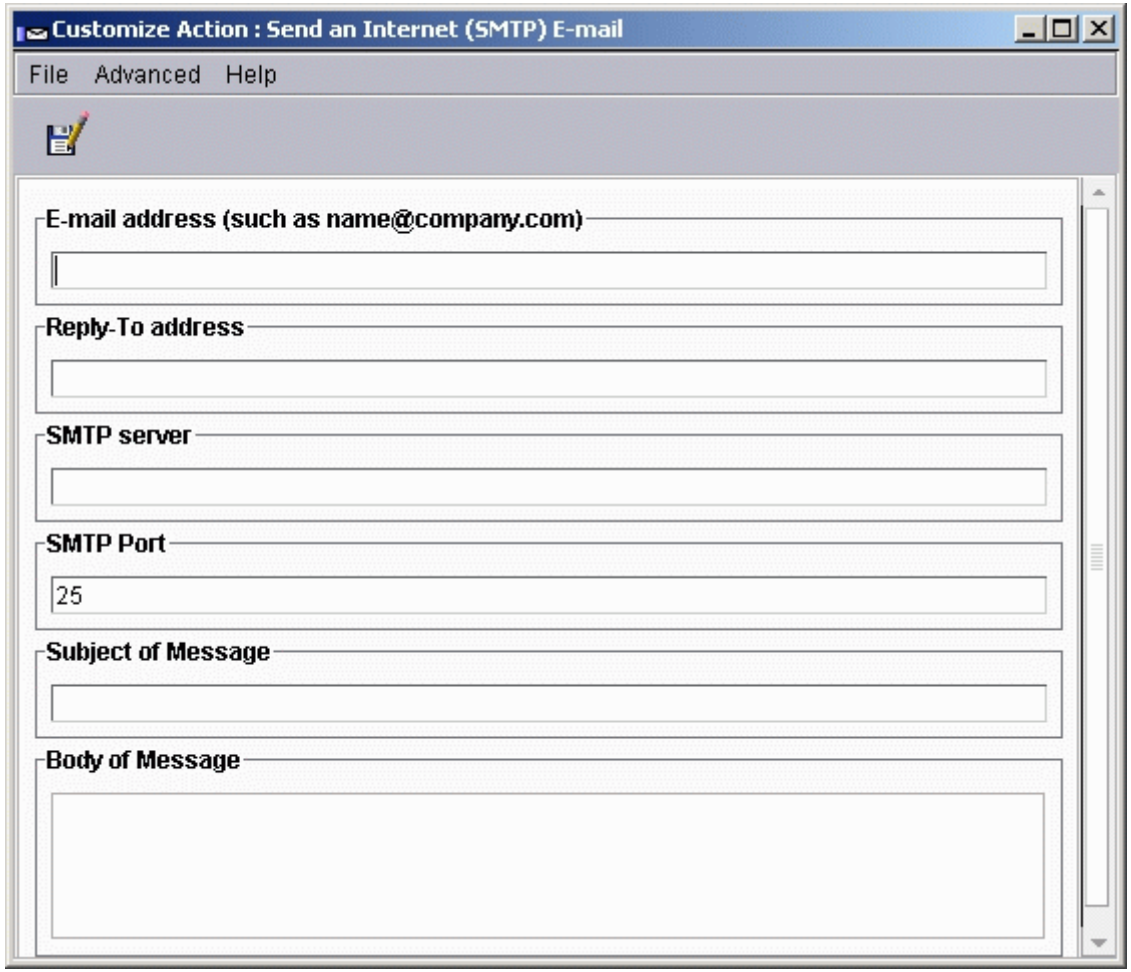

Set thresholds for events →

# Base Management: Event Action Plan

- EAP is composed of filters and associated actions
- EAP can be applied to any system or group



# Base Management: Event Action Plan - Action




- Most actions require customization

# Product Overview

**IBM Director base functions for Linux on System z**

- Discovery
- Group Management
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- Basic Resource Monitor
- Event Action Plan
- Process Management
- Remote Session
- File Transfer
- Network Configuration
- Software Distribution
- SNMP Browser

**z/VM Center**

- Utility Service Configuration Manager
- z/VM Virtual Server Deployment
- z/VM Server Complexes

**Software Distribution Premium Edition**

- SW package distribution

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| Base | **IBM Director** |
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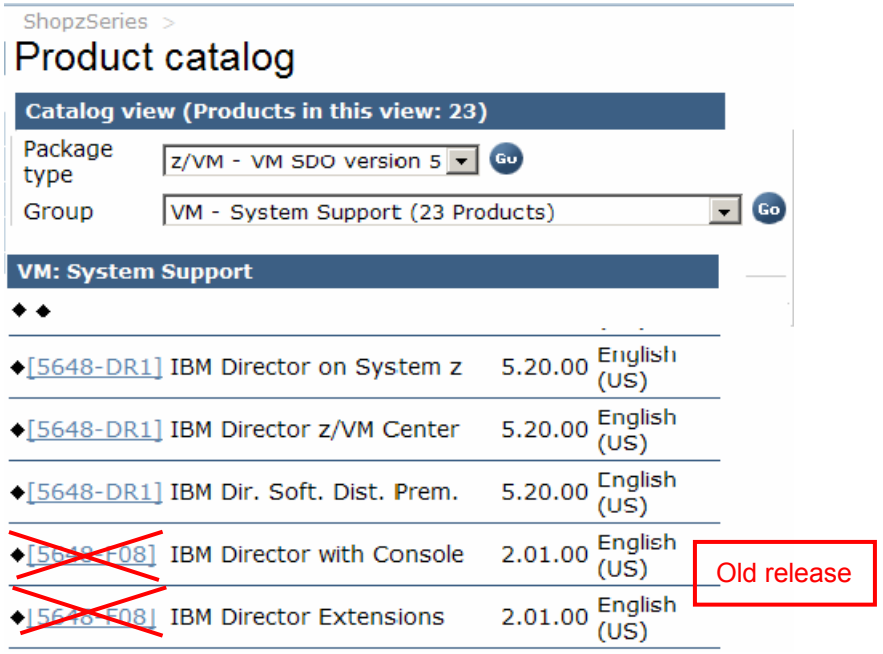
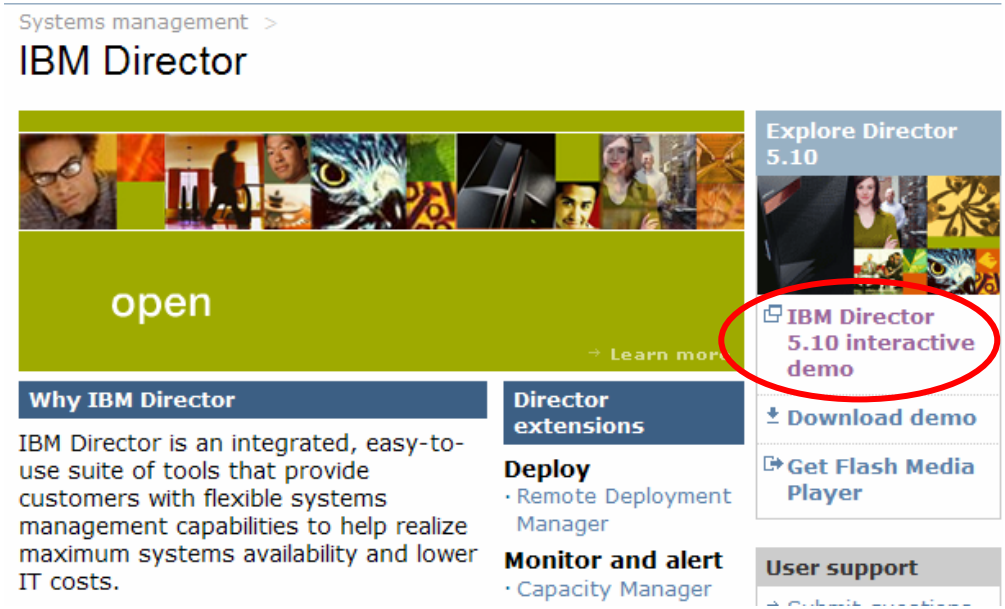
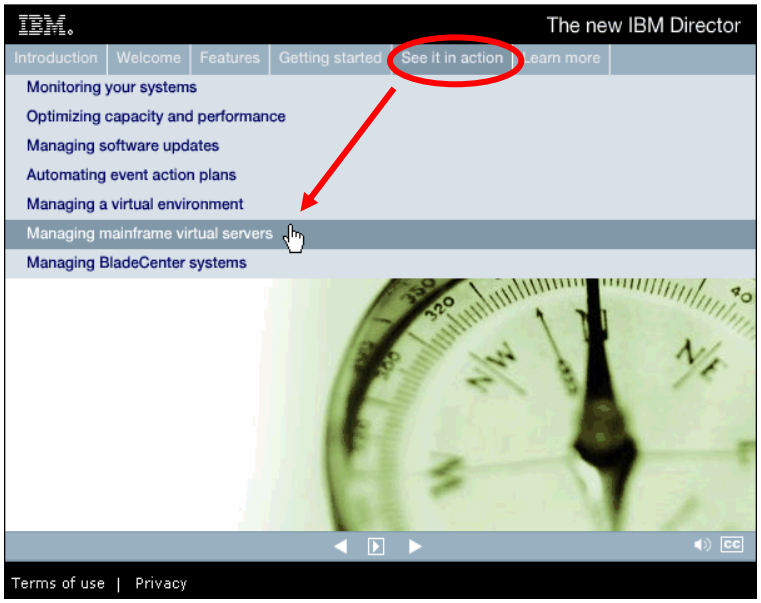


# IBM Director Extension - z/VM Center

- **Virtual Server Deployment (VSD) - Easy deployment of Linux virtual servers under z/VM**
  - Creation of templates for virtual server and Linux operating system provisioning
  - Creation of virtual server from template
  - Applying Linux into a virtual server from template




www-03.**ibm.com**/servers/eserver/xseries/systems_management/ibm_director/

- **Server Complexes – On-going management of Linux virtual servers**
- **Utility Service Configuration Manager – Ease-of-use application configuration (via HTTP or CIM)**

# z/VM Center – Task 'Virtual Server Deployment'

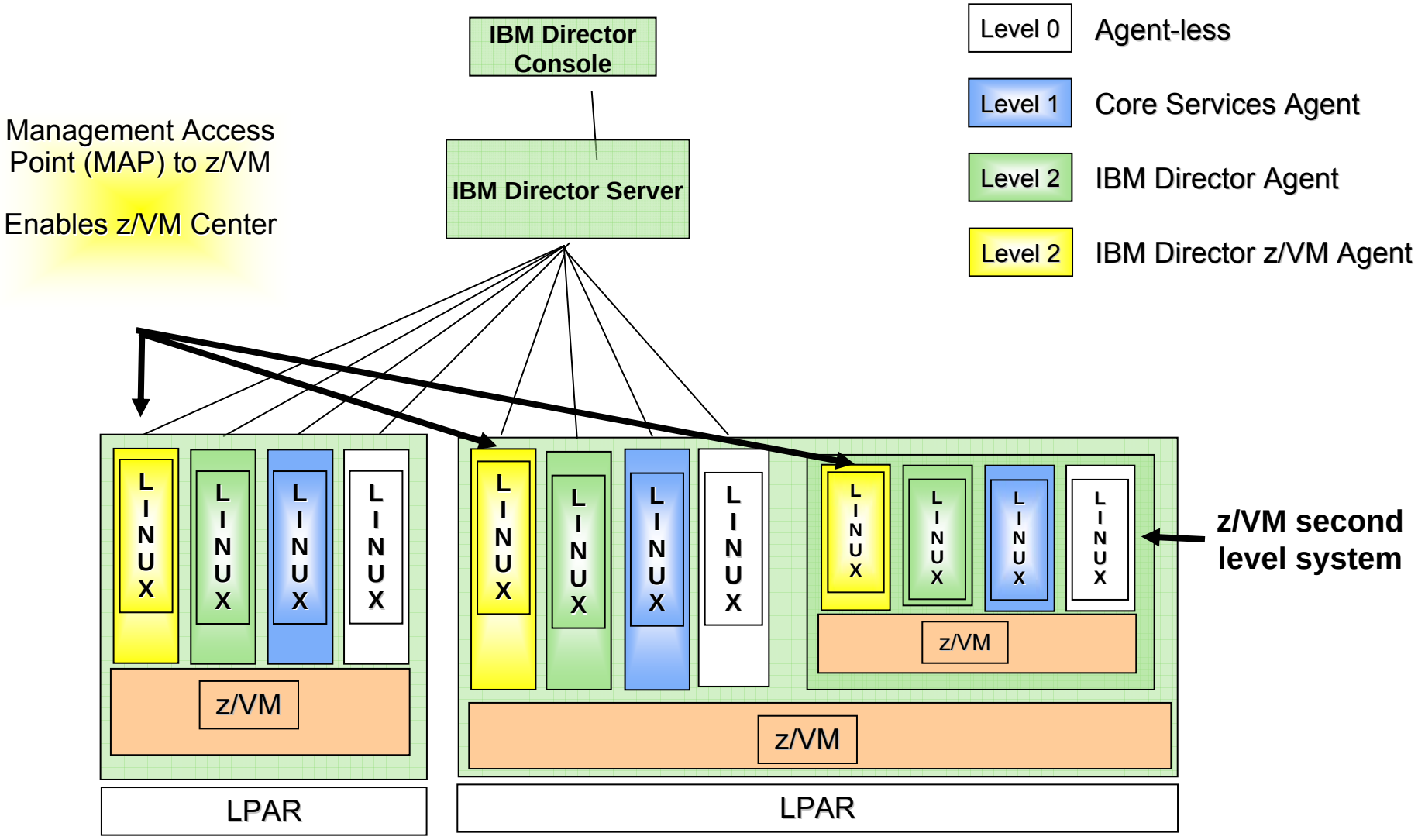
**Supported Operating System**

| | |
|---|---|
| Linux on zSeries | Red Hat Enterprise Linux AS, Version 4.0<br>Novell SUSE Linux Enterprise Server 9 (Service Pack 2) & 10 |
| z/VM | z/VM 5.2, requires DirMaint – see z/VM Center set-up |

**Virtual Server Deployment - Basic provisioning of virtual guests on z/VM**

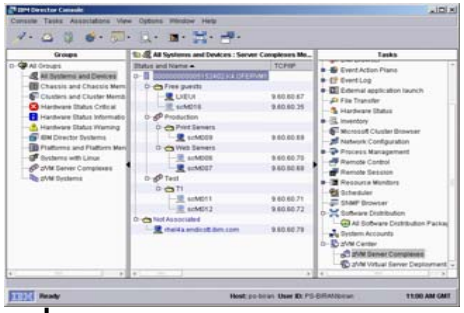
| | |
|---|---|
| z/VM System Status | List existing virtual servers (virtual guests) running under the selected z/VM system + properties of virtual servers |
| Templates | Use templates to provision new z/VM virtual server and Linux operating systems<br>Templates can be created as snap-shot of existing virtual servers or Linux systems, or defined new via a wizard |
| Create virtual server under z/VM | Use virtual server template to provision new virtual server |
| Deploy Linux operating system | Use operating system template to provision Linux operating system |

# IBM Director z/VM Center – Topology

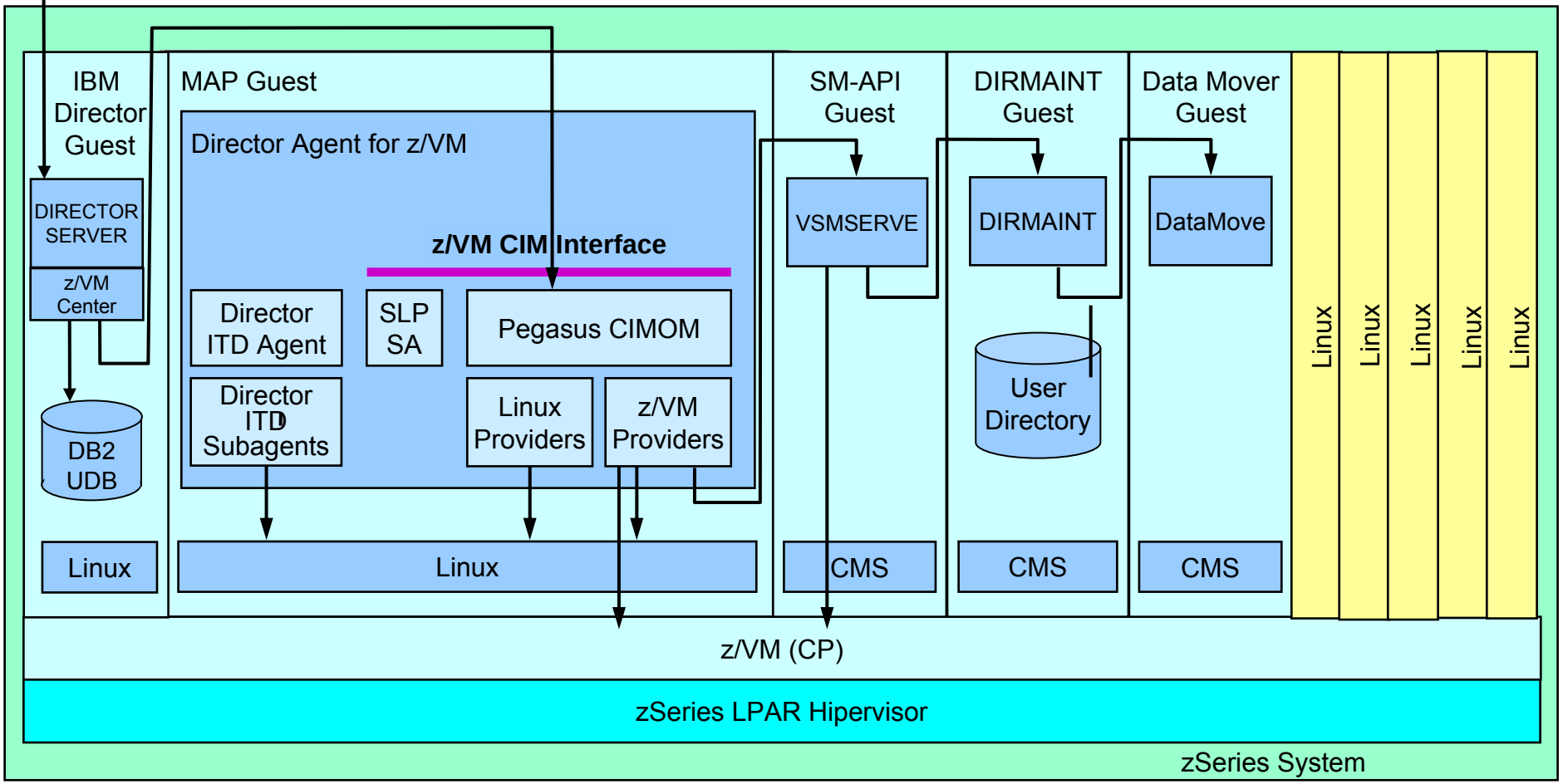


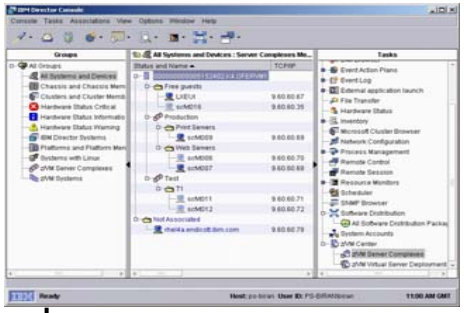
# IBM Director 5.10 Degrees of Management

| IBM Director Feature | Agentless<br>*Level 0* | Core Services<br>*Level 1* | IBM Director Agent<br>*Level 2* |
|---|---|---|---|
| Discovery<br>System Attributes<br>Power Control<br>Remote Session on Linux<br>Basic Inventory | ↓ | ↓ | ↓ |
| Platform Specific Inventory<br>Hardware Status<br>Event Action Plans<br>Event Log<br>Update Assistant<br>Upward Integration | | ↓ | ↓ |
| Process Management<br>Remote Session on Windows<br>File Transfer<br>ServeRaid Manager<br>Software Distribution<br>CIM Browser<br>SNMP Browser<br>Scheduler | | | ↓ |

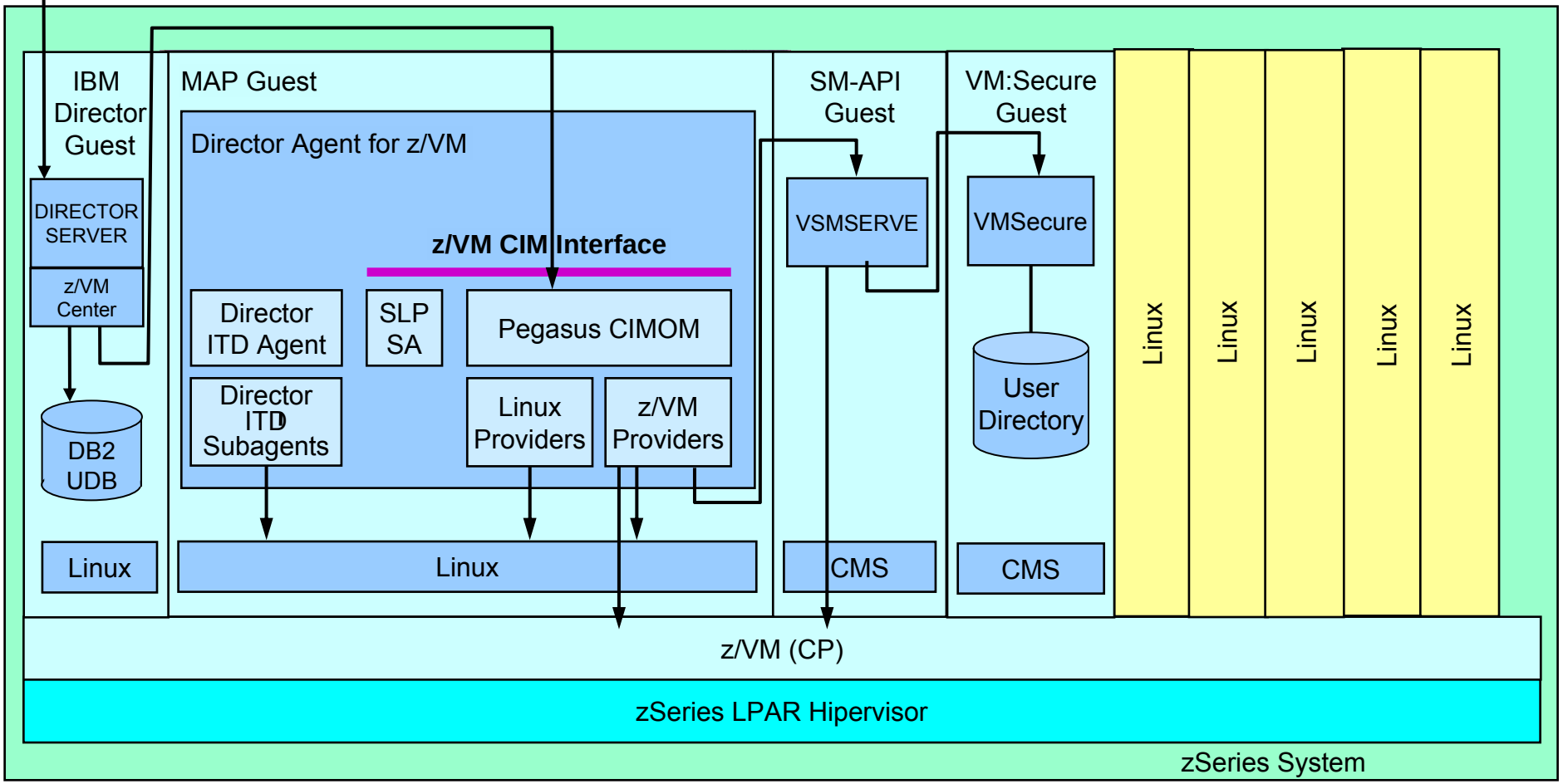


# IBM Director Topology on z/VM with Directory Maintence (DirMaint)





# IBM Director Topology on z/VM with CA VM:Secure



# MAP to z/VM – Assisted Install

**Get the set-up and configuration of the z/VM MAP Linux system right the first time**

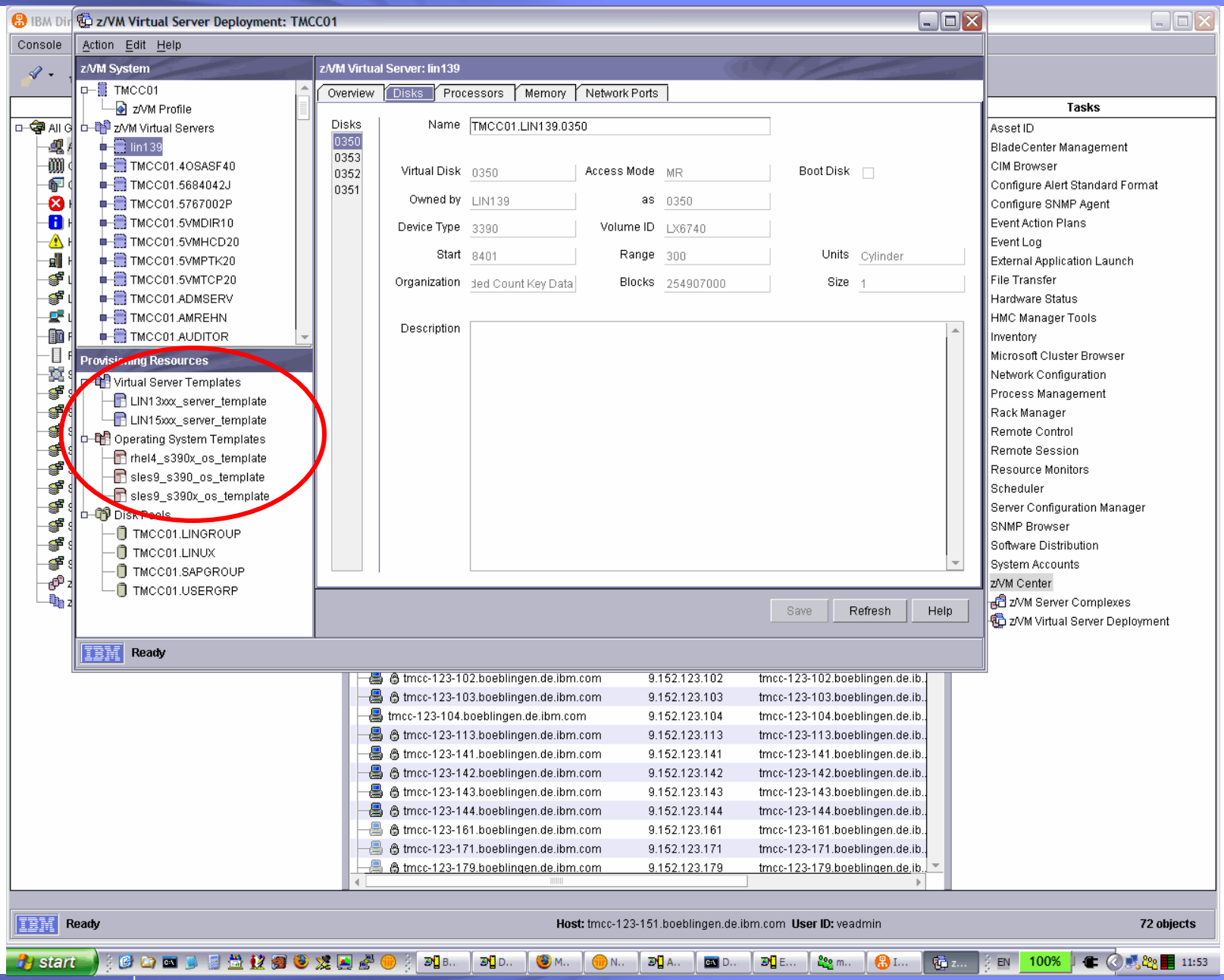
**Install the Linux operating system incl. IBM Director Agent and/or Server "out of the box" via delivered:**

- Scripts (REXX and bash) and
- Configuration files (kickstart and autoyast)

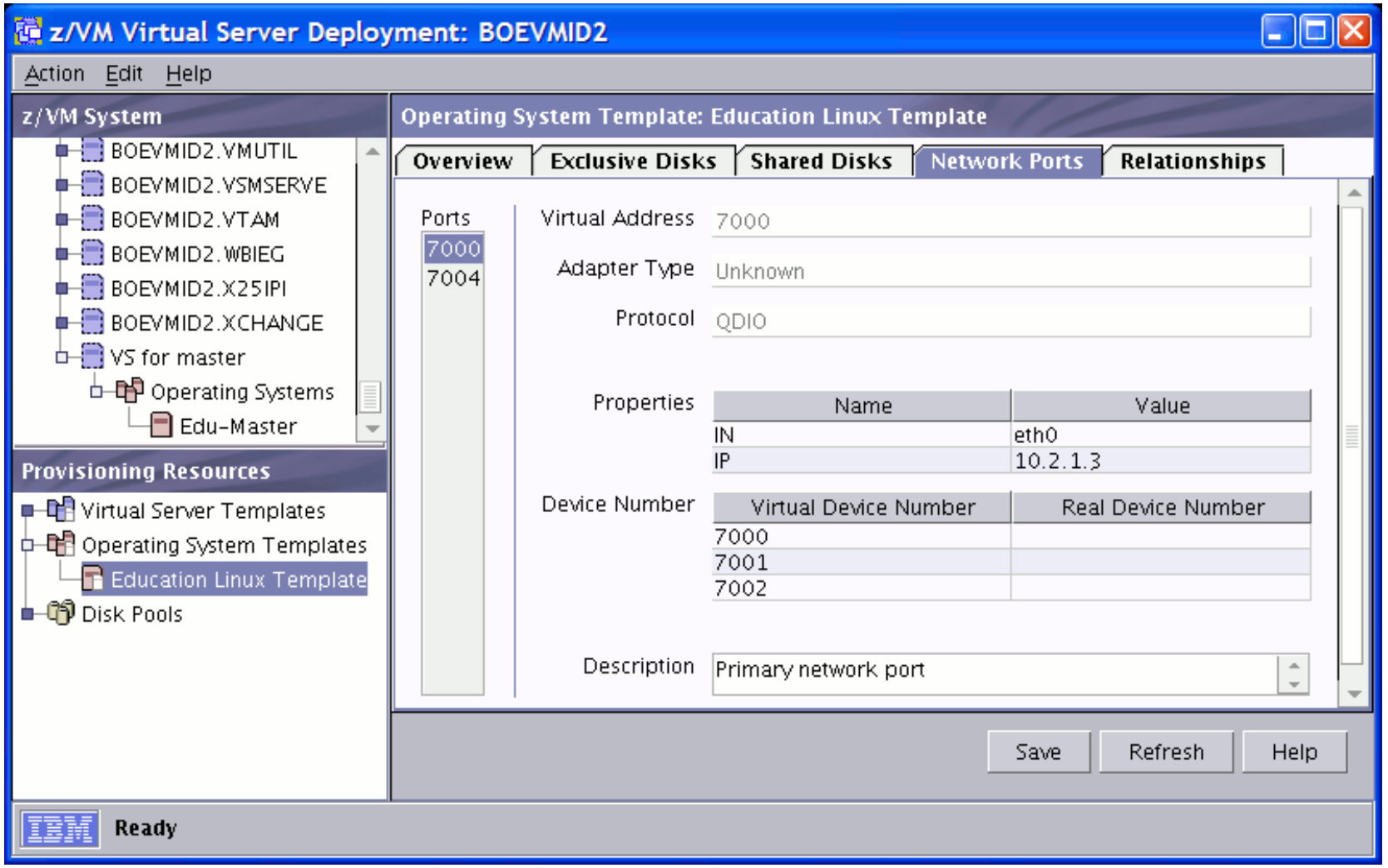
**z/VM guest has to be created manually for installation**

**User dialog asks administrator for installation related parameters**

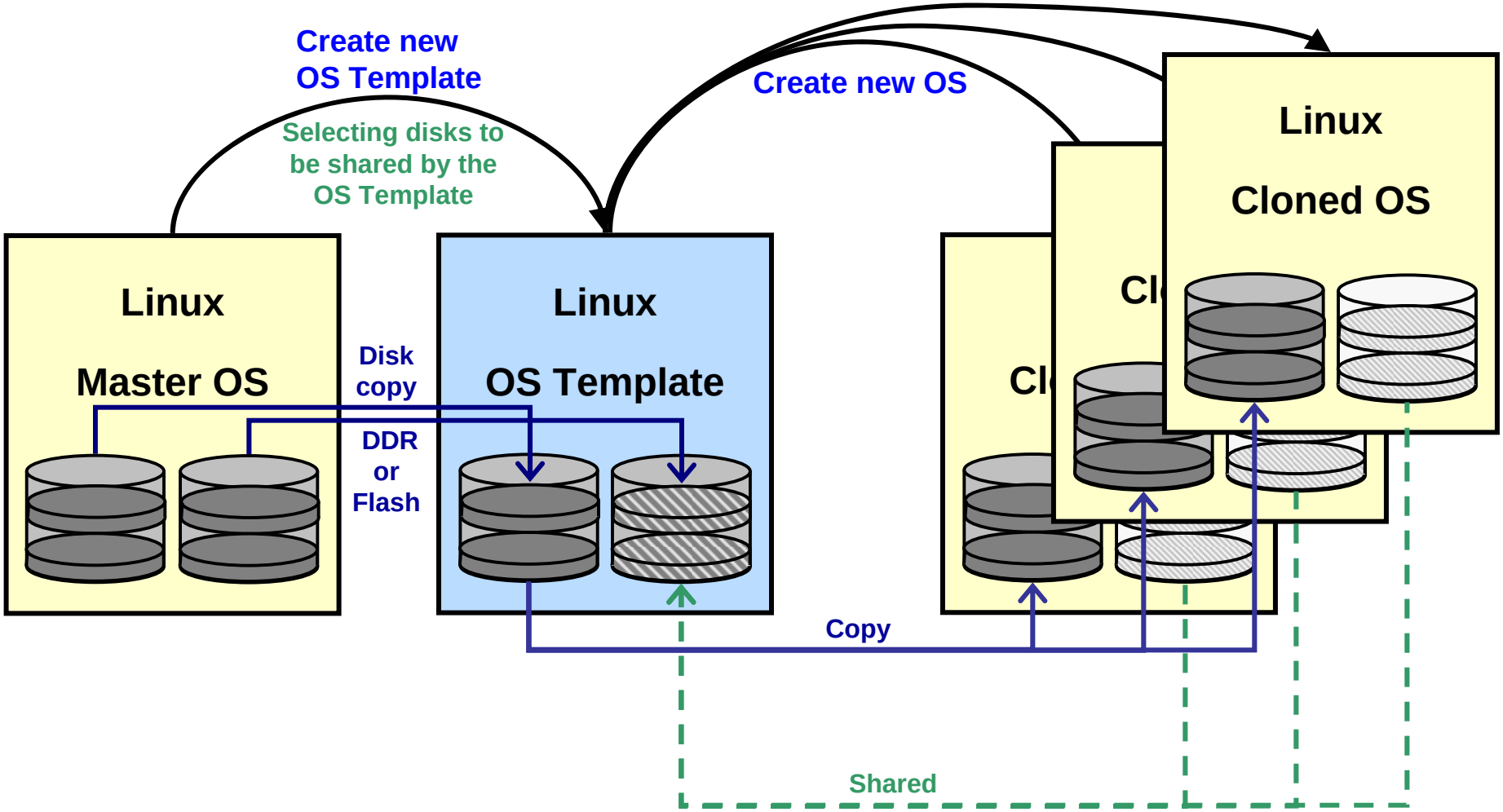
- Linux distribution type (SLES vs. RHEL)
- Network setting of the new guest (IP address, hostname, gateway, virtual network ports etc.)
- Guest user parameters (user ID, minidisk address for the new Linux)
- FTP parameters
  - (server, path, ftp account) where the Linux distributors CDs are available
  - (server, path, ftp account) where the IBM Director installation CD is available
  - (server, path) where the autoinst/kickstart configuration files are available
- Time zone, locale
- Installation timeout


z/VM Virtual Server Deployment: TMCC01
Action Edit Help
z/VM System
TMCC01
z/VM Profile
z/VM Virtual Servers
lin139
TMCC01.4OSASF40
TMCC01.5684042J
TMCC01.5767002P
TMCC01.5VMDIR10
TMCC01.5VMHCD20
TMCC01.5VMPTK20
TMCC01.5VMTCP20
TMCC01.ADMSERV
TMCC01.AMREHN
TMCC01.AUDITOR
Provisioning Resources
Virtual Server Templates
LIN13xxx_server_template
LIN15xxx_server_template
Operating System Templates
rhel4_s390x_os_template
sles9_s390_os_template
sles9_s390x_os_template
Disk Pools
TMCC01.LINGROUP
TMCC01.LINUX
TMCC01.SAPGROUP
TMCC01.USERGRP
z/VM Virtual Server: lin139
Overview Disks Processors Memory Network Ports
Disks
0350
0353
0352
0351
Name TMCC01.LIN139.0350
Virtual Disk 0350
Access Mode MR
Boot Disk
Owned by LIN139
as 0350
Device Type 3390
Volume ID LX6740
Start 8401
Range 300
Units Cylinder
Organization ded Count Key Data
Blocks 254907000
Size 1
Description
Save Refresh Help
Ready
Tasks
Asset ID
BladeCenter Management
CIM Browser
Configure Alert Standard Format
Configure SNMP Agent
Event Action Plans
Event Log
External Application Launch
File Transfer
Hardware Status
HMC Manager Tools
Inventory
Microsoft Cluster Browser
Network Configuration
Process Management
Rack Manager
Remote Control
Remote Session
Resource Monitors
Scheduler
Server Configuration Manager
SNMP Browser
Software Distribution
System Accounts
z/VM Center
z/VM Server Complexes
z/VM Virtual Server Deployment
tmcc-123-102.boeblingen.de.ibm.com 9.152.123.102
tmcc-123-103.boeblingen.de.ibm.com 9.152.123.103
tmcc-123-104.boeblingen.de.ibm.com 9.152.123.104
tmcc-123-113.boeblingen.de.ibm.com 9.152.123.113
tmcc-123-141.boeblingen.de.ibm.com 9.152.123.141
tmcc-123-142.boeblingen.de.ibm.com 9.152.123.142
tmcc-123-143.boeblingen.de.ibm.com 9.152.123.143
tmcc-123-144.boeblingen.de.ibm.com 9.152.123.144
tmcc-123-161.boeblingen.de.ibm.com 9.152.123.161
tmcc-123-171.boeblingen.de.ibm.com 9.152.123.171
tmcc-123-179.boeblingen.de.ibm.com 9.152.123.179
Ready
Host: tmcc-123-151.boeblingen.de.ibm.com User ID: veadmin
72 objects
start
11:53

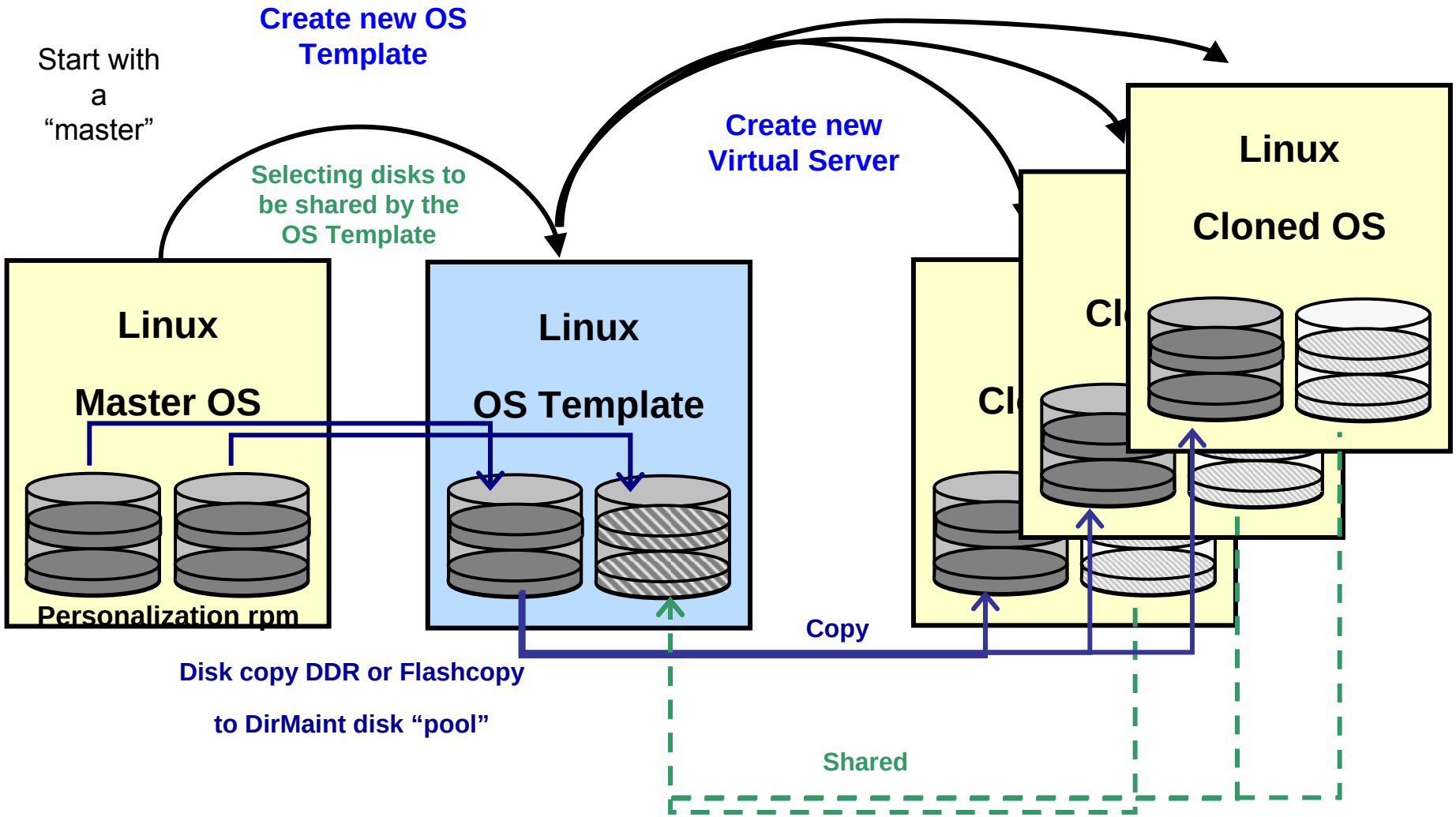
# Operating System Template



# Operating System (OS) Template - Concept



# Operating System Template concept



# z/VM Center – Task 'Server Complexes'

**Server Complexes – Ease-of-use Virtual Server Deployment**

- Automates configuration of z/VM Linux guests
- Configuration settings can be predefined via the properties of a server complex
- Every Linux guest which is added/cloned to a server complex, is configured according to these properties
  - taking care of the underlying z/VM as well as Linux configuration

**Fast cloning**

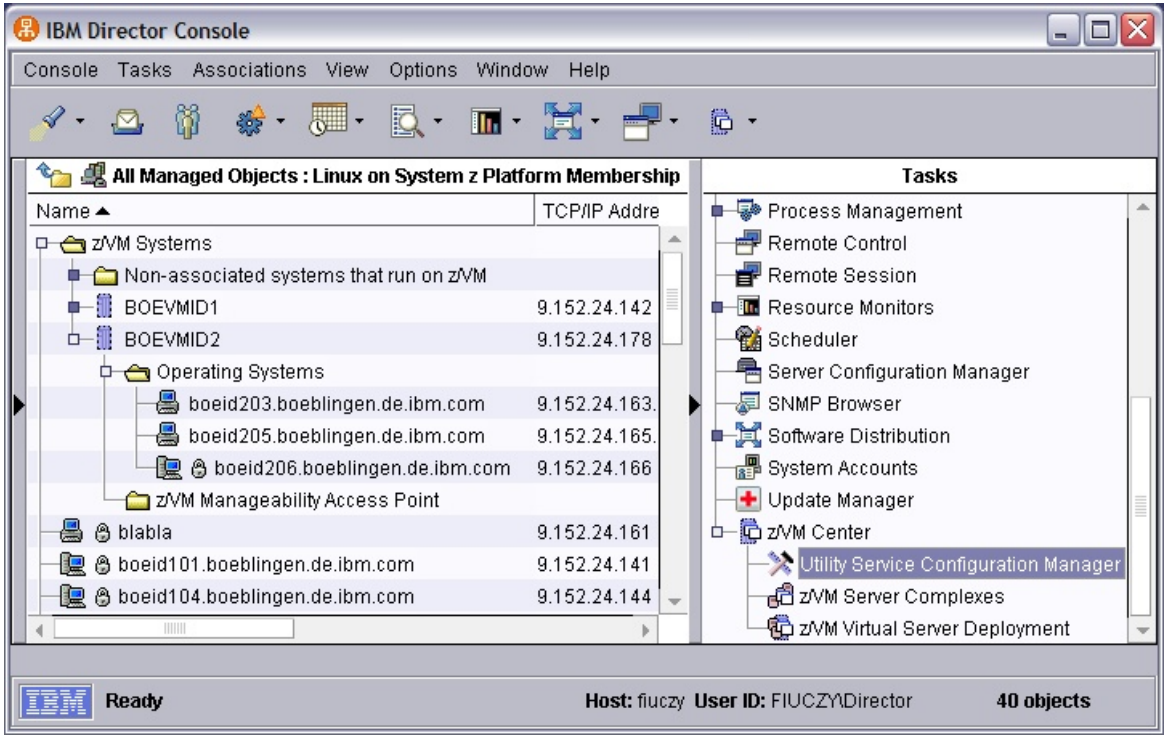
- Virtual Server Deployment with predefined configuration settings
- z/VM Linux guest systems creation with minimal manual interaction

**Customization**

- Personalization of clones via scripts

**Reduced failures**

- Configuration consistency (z/VM and Linux) is controlled:
  - Deviations are listed
  - Consistent configuration is applied



# z/VM Center – Server Complexes

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|---|---|
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| z/VM | z/VM 5.2, requires DirMaint |

**Server Complexes -** Ease-of-use Virtual Server Deployment

| | |
|---|---|
| Tiers/Guests in a Server Complex | Server Complexes are defined per z/VM; they predefine the configuration settings of multiple Linux virtual servers – every tier in a Server Complex might represent its own different configuration settings |
| Configuration Properties | Allows predefinition of network settings (LAN, VSwitch, OSA), minidisks and z/VM resource allocations to tiers within a Server Complex |
| Cloning | Multiple instances of Linux operating systems can be deployed without interaction for configuration specification |

# z/VM Center – Task 'Utility Service Configuration Manager ' & Software Distribution Premium Edition

**Utility Service – Ease-of- use application deployment and configuration**

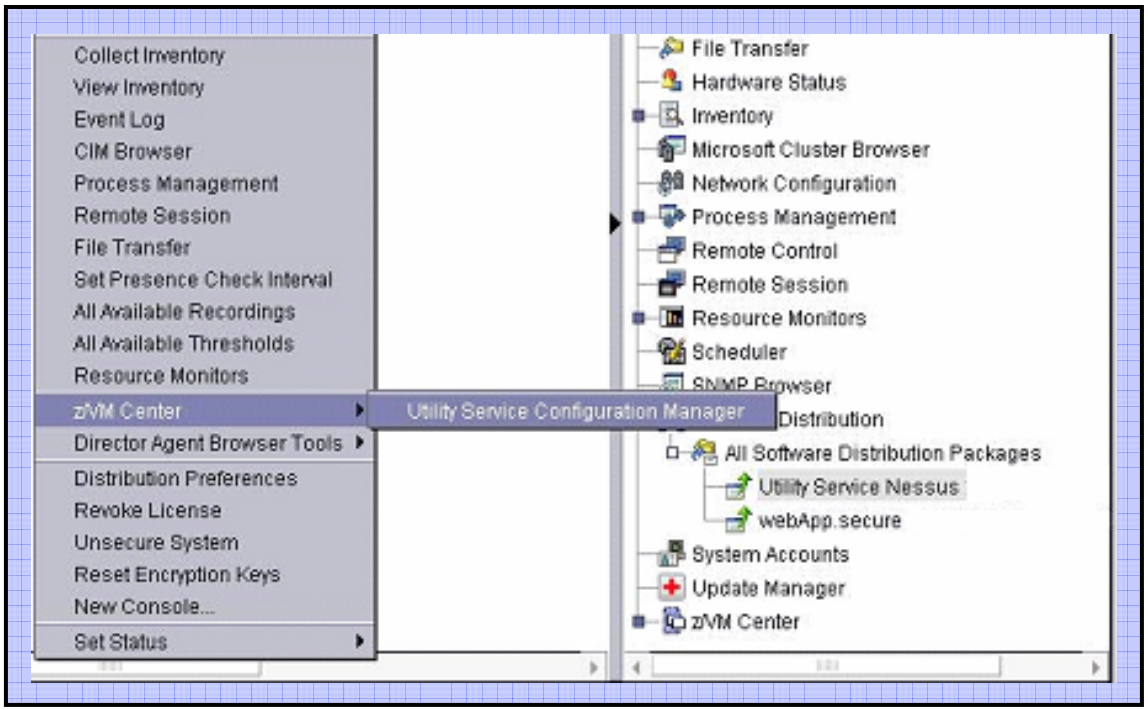
- Application installation and customization steps are prepared
- User can do application installation and configuration without specific knowledge of underlying operating system

**Fast, easy deployment of applications**

- Prepared application installation and customization instructions/software packages
- Deployment via Software Distribution Premium Edition

**Easy customization of application configuration**

- Configuration settings can be changed from remote
- Configuration menu in IBM Director Console (CIM based) or in launched browser



# IBM Director Extension - 'Software Distribution Premium Edition'

**Keep IT Environment up-to-date**

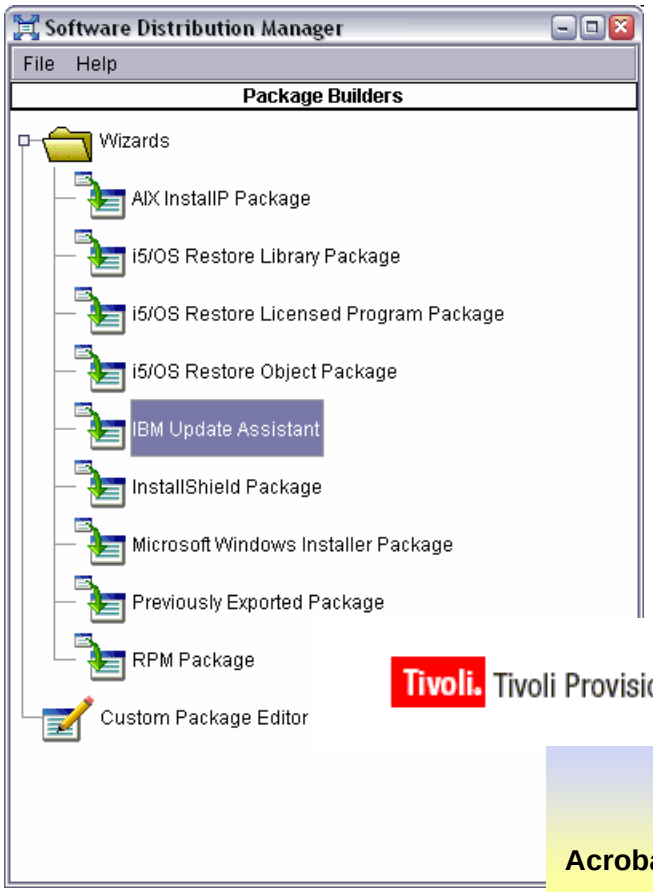
- 'Software distribution' – part of the base management functions of IBM Director allows to distribute IBM-provided software packages
- Premium Edition enables to both build and distribute own software packages

**Easy creation and distribution of software packages**

- Wizards support the build of different software distribution packages
- Rich set of supported software distribution packages – see screen shot
- Flexible distribution options
  - to individual systems or groups of systems
  - at a scheduled date and time
- Streaming and redirection methods of distributing software

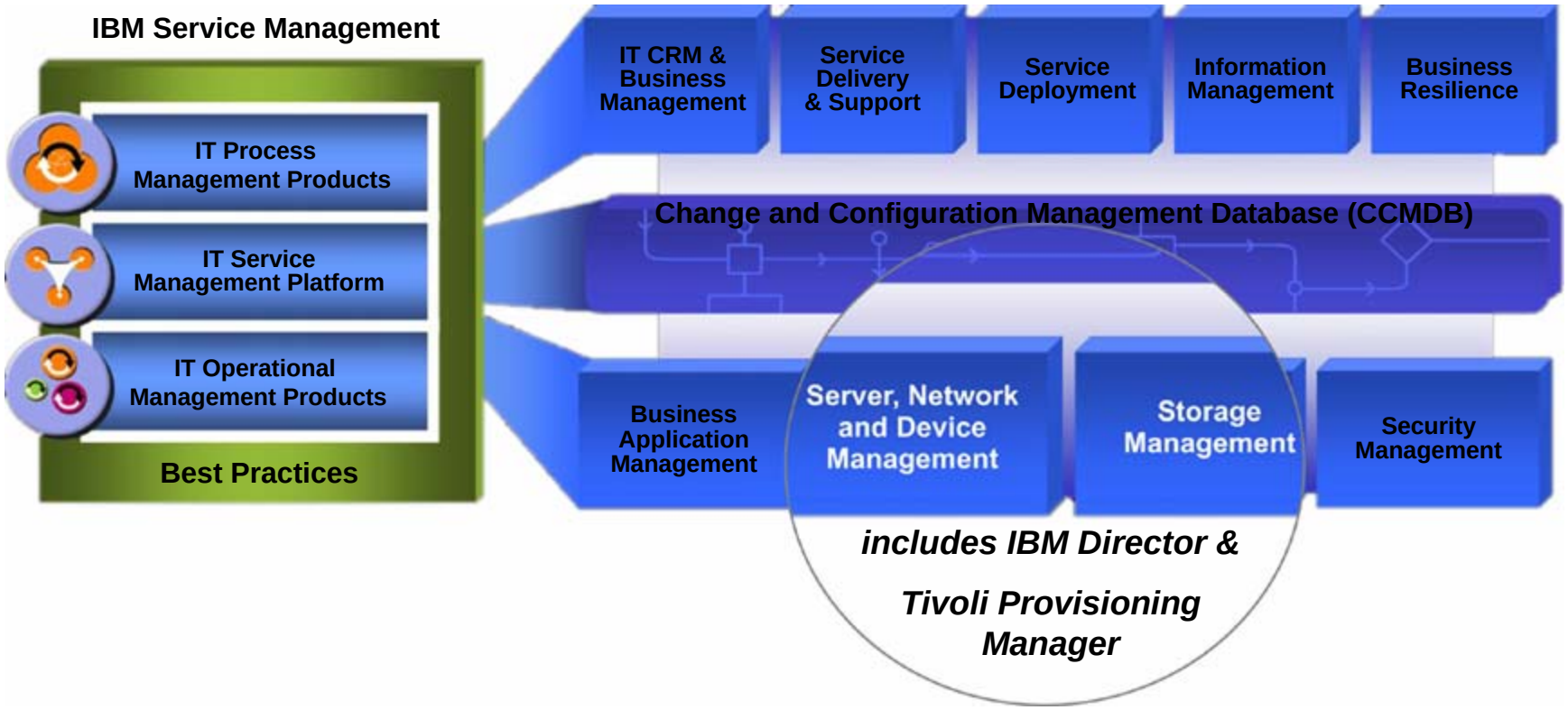
**Re-use of software packages**

- Exported software package can be imported to Tivoli Provisioning Manager for Software

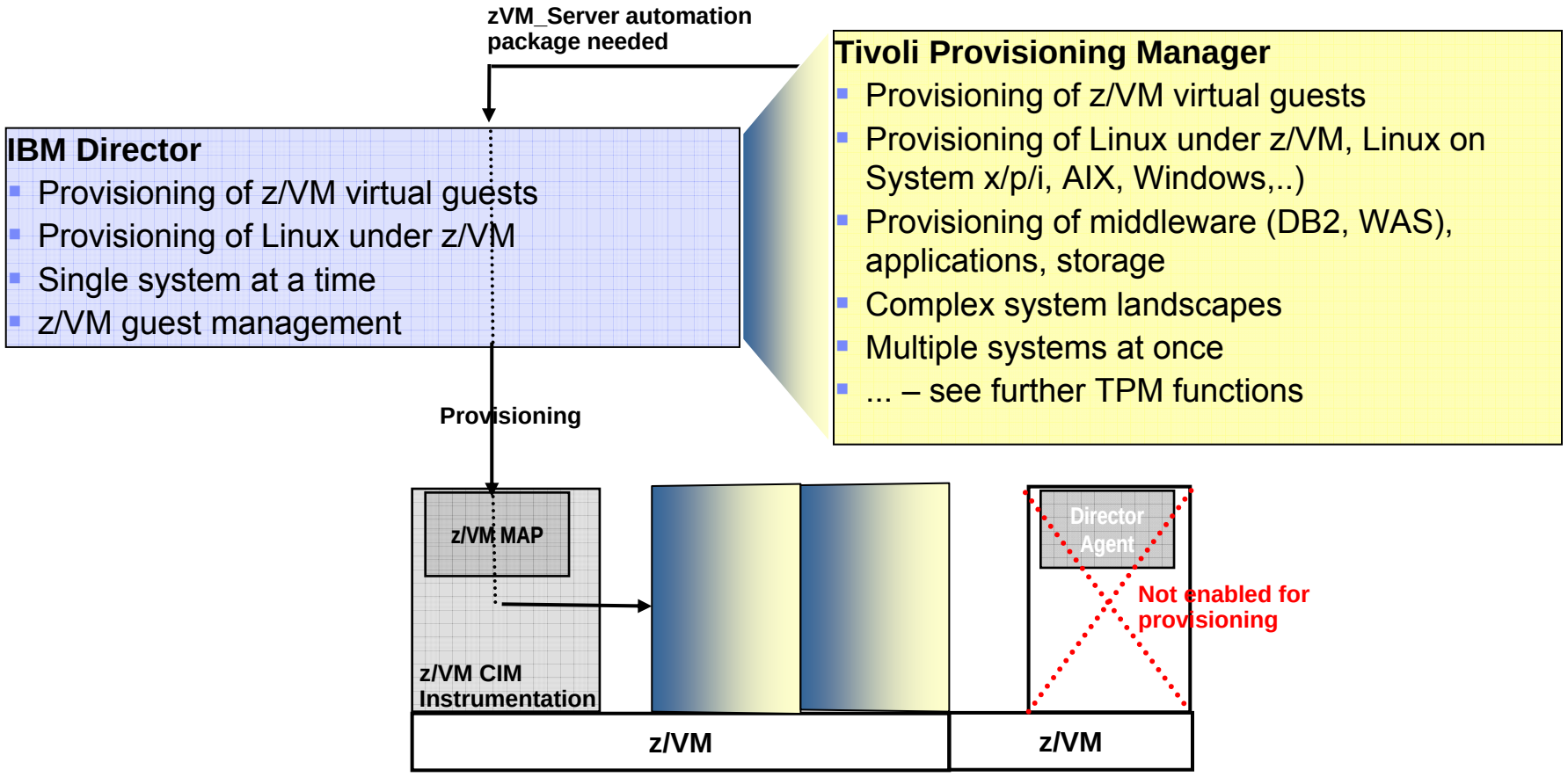


# IBM Director and IBM Service Management

## A better way to manage the business of IT



# IBM Director + TPM – Integration Architecture




z/VM Manageability Access Point (MAP) = z/VM set-up needed for provisioning of z/VM Linux

- Set-up only once
- Leveraged by IBM Director and Tivoli Provisioning Manager (TPM)

# Learning Points

## IBM Director for Linux on System z

- Is part of IBM Systems Director family – the unified family of platform management tools for managing
  - Physical and virtual resources together, servers, storage, networking, IBM and compatible non-IBM resources
  - With seamless integration into IBM Service Management offerings from Tivoli
- Supports System z virtualization leadership with z/VM
  - Attractive GUI reduces skill requirement for z/VM administration
  - Enables an easy start – start with one product only to get the basic systems management functions
  - Enables fast and easy provisioning of new z/VM Linux systems

# Additional Information and Documentation

**IBM Director for Linux on System z website:** http://www.vm.ibm.com/sysman/director/

**Announcement - IBM Director V5.20 for Linux on System z:**

http://www-306.ibm.com/common/ssi/rep_ca/4/897/ENUS206-294/ENUS206-294.PDF

**IBM Director (cross platform) website:** http://www-03.ibm.com/systems/management/director/index.html

**IBM Director extension – z/VM Center**

Overview: http://www-03.ibm.com/systems/management/director/extensions/zvm.html

Concepts: http://publib.boulder.ibm.com/infocenter/eserver/v1r2/index.jsp?topic=/diricinfo/vsd0_c_concepts.html

**IBM Director extension – Software Distribution Premium Edition**

http://www-03.ibm.com/systems/management/director/extensions/sdpe.html

**IBM Director Information Center – see IBM Director V5.20**

http://publib.boulder.ibm.com/infocenter/eserver/v1r2/index.jsp?topic=/diricinfo/fqm0_main.html

**IBM Director Documentation and Resources –** see z/VM Center v5.10 and v5.20:

http://www-03.ibm.com/systems/management/director/resources/index.html#director_extensions

**IBM Director – download page:** https://www14.software.ibm.com/webapp/ShopzSeries/ShopzSeries.jsp

Specify Package type ‘z/VM – VM SDO version 5‘ and Group ‘VM – System Support (20 Products)

**IBM Director V5.10 updates – download**

pagehttp://www-304.ibm.com/jct01004c/systems/support/supportsite.wss/docdisplay?lndocid=MIGR-65094&brandind=5000016

**IBM Director 5.10 Interactive demo**:

Select ‘See it in action – Managing mainframe virtual servers’: www-03.ibm.com/servers/eserver/xseries/systems_management/ibm_director

**z/VM Center scenario** – Provisioning Linux to students:

http://publib.boulder.ibm.com/infocenter/eserver/v1r2/index.jsp?topic=/diricinfo/vsd0_t_zvm_scenarios.html

# Additional Information and Documentation cont.

**Redpiece 'Managing Linux Guests Using IBM Director and z/VM Center':**
http://www.redbooks.ibm.com/redpieces/abstracts/redp4312.html

**Redbook 'Implementing IBM Director V5.20':** http://www.redbooks.ibm.com/abstracts/sg246188.html

**Redbook 'Virtualization Engine Version 2.1'** http://www.redbooks.ibm.com/redbooks/pdfs/sg247276.pdf

**System management Guide:** ftp://ftp.software.ibm.com/pc/pccbbs/pc_servers_pdf/dir4.20_docs_sysmgt.pdf

**CIM**: http://www.dmtf.org/standards/cim

**IBM Service Management (Tivoli):** http://www-306.ibm.com/software/tivoli/solutions/it-service-management/

**Tivoli Provisioning Manager**: http://tivoli.torolab.ibm.com:7070/display/tpmvirtcomm/Home

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