How To Effectively Incorporate Linux on System z Events Into Your OPS/MVS or SOLVE:Operations Automation Policies

August 9, 2012 - SHARE Session **11266**

Summer Spaulding

CA Technologies

Abstract

Connecting Linux on System z to Your CA z/OS Automation Products

In this session, we will explain how to install the Connector and will provide an overview of its capabilities. This session will be of interest to any OPS/MVS or SOLVE:Operations customer who runs workloads on Linux on System z (or is considering doing so).

Agenda

- Integrating Linux into System z
- CA Mainframe Connector for Linux on System z Overview
- Installing CA Mainframe Connector for Linux on System z
- Connector Capabilities -- Configuration and Runtime

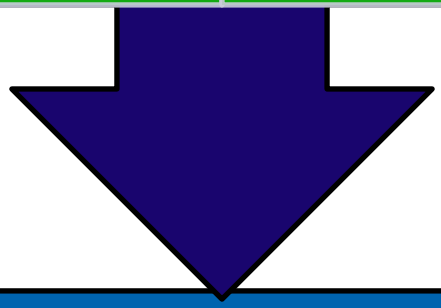
Integrating Linux into System z

- Companies are consolidating their disparate Linux workloads onto the mainframe
  - Such sites have relied on **CA OPS/MVS® Event Management and Automation** or **CA SOLVE:Operations Automation** for many years
  - Their Operators and Systems Programmers have many years experience in z/OS mainframe data centers but know only basic IBM z/VM and Linux on System z
  - They understand the business importance of the production Linux on System z workloads and the services they enable
  - They desire the same high level of management and visibility as they do on z/OS
- Today Linux on System z is more integrated with mainframe applications

Integrating Linux into System z (Cont.)

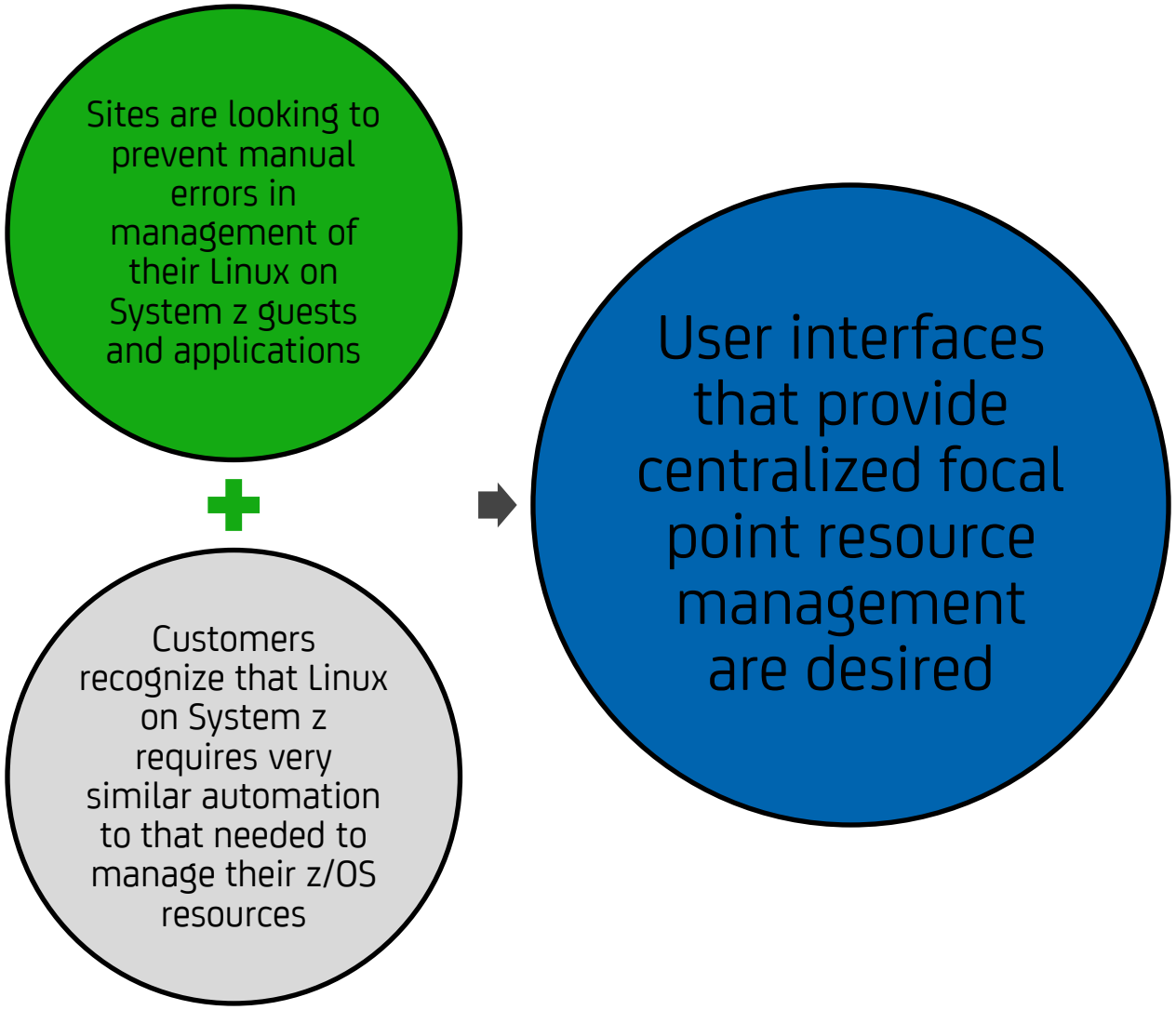
For many sites this naturally ties into their mainframe automation

Is Linux on System z image active?	Is Linux on System z image experiencing problems?	Is host VM system experiencing problems?	Is Linux on System z application active?	Is Linux on System z application experiencing problems?	Is z/OS prerequisite resource active?



Systems programmers understand that there is much similarity between USS and Linux on System z resources (e.g., processes)

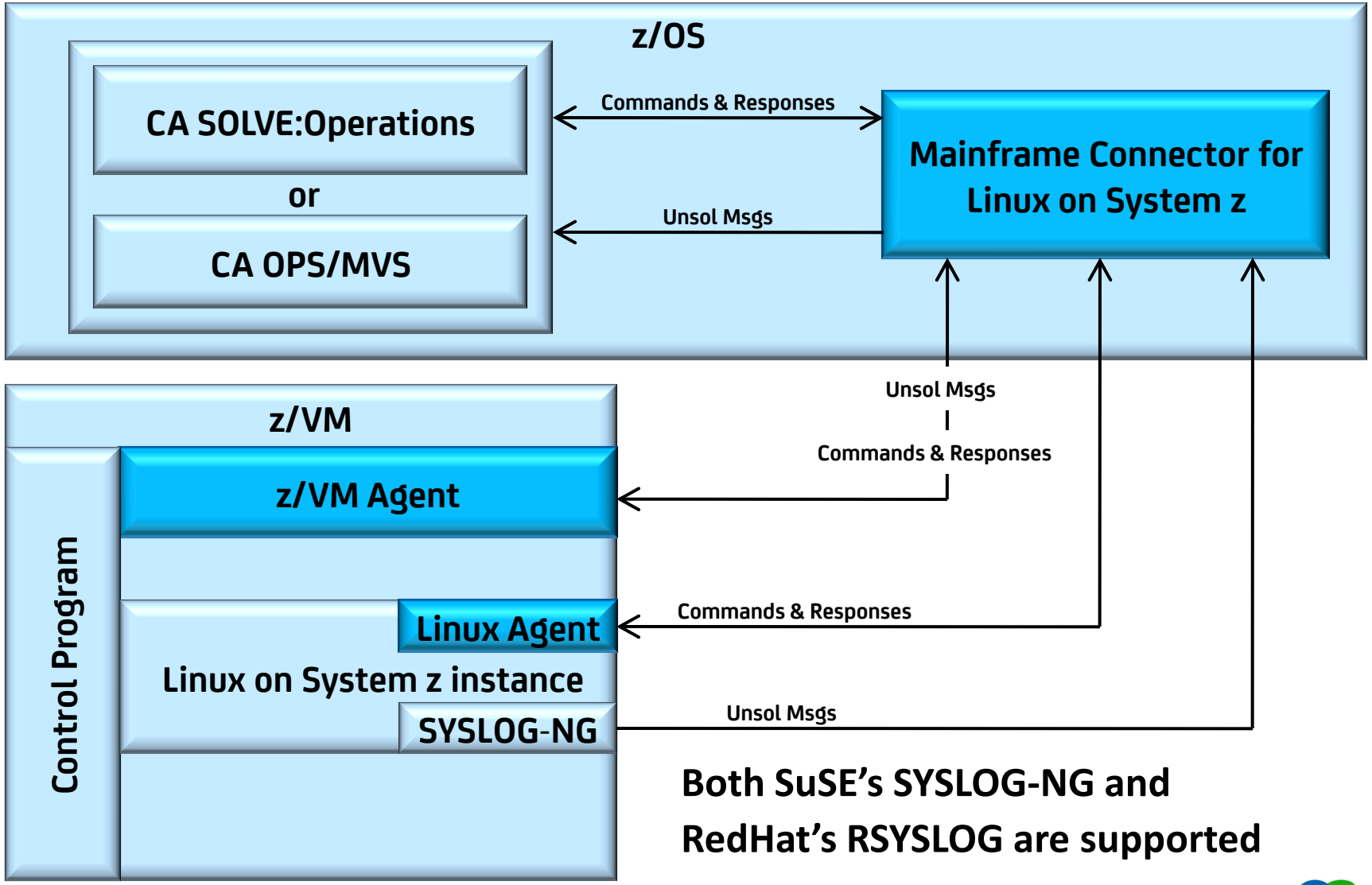
Integrating Linux into System z (cont.)



CA Mainframe Connector for Linux on System z

- Started Task independent of other client software
- Provides TCP/IP pipe between Linux on System z, z/VM & z/OS
- Command/response for Linux on System z objects from z/OS
- Event feed from Linux on System z to z/OS
- Automatic discovery of z/VM and Linux on System z systems

CA Mainframe Connector Logical Overview



CA Mainframe Connector Components

Architecture consists of 3 separate components:

Mainframe Connector for Linux region on z/OS

- This runs as a standalone region on z/OS as a 'black box', providing a communication path for the z/VM and Linux on System z agents which can be utilized by CA SOLVE:Operations **or** CA OPS/MVS

z/VM Agent

- The z/VM agent interfaces with the Connector for Linux region to deliver unsolicited events/messages. It will also receive z/VM commands from Connector for Linux region and return the responses

Linux on System z Agent(s)

- The Linux on System z agent(s) interfaces with the Connector for Linux region to deliver unsolicited messages and receive Linux commands and return the responses

Install and Configuration Process

- **Step 1**
  - Install and set Up a z/OS Region
- **Step 2**
  - Install and configure z/VM Agents
- **Step 3**
  - Install and configure the Linux Syslog Daemon
- **Step 4**
  - Install and configure Linux Agents
- **Step 5**
  - Update OPS/MVS Parms or SOLVE:Operations Parameter Group

Obtaining Installation Software

CA MSM PRE VAL UTIL-ESD ONLY 50000068XU1.pax.Z	5.0 /0000	05/30/2012	3.29MB	☐	Download
CA MSM PRE VALIDATION INSTR 50000068XU1CL.pdf	5.0 /0000	05/15/2012	411.08KB	☐	Download
EZTRVE REPORT GENERATOR CCS B60000ESA00.pax.Z	[illegible]	[illegible]	6.12MB	☐	Download
CA OPS/MVS PRODUCT TAPE C00000NYI00.pax.Z	12.0 /0000	06/07/2012	20.83MB	☐	Download
CA MF CONNECTR FOR LINUX SYS Z C2D72G0.pax.Z	1.0 /0000	08/29/2011	62.42MB	☐	Download
[illegible] INTFCE SERV FM CA TECH C2D73G0.pax.Z	1.0 /0000	08/29/2011	8.03MB	☐	Download
DATACOM/AD PROD INFO PACKET CAIE00000P0.pdf	14.0 /0000	06/01/2012	220.53KB	☐	Download
DATACOM/AD XPRESS INSTALL E00000CAI00.pax.Z	14.0 /0000	06/04/2012	48.57MB	☐	Download
CA COMMON SERVICES COVER LTR RI45048.pdf	14.1 /0000	06/26/2012	183.1KB	☐	Download
CA MSM COVER LETTER RI45051.pdf	5.0 /0000	05/16/2012	178.43KB	☐	Download
OPS/MVS COVER LETTER RI46937.pdf	12.0 /0000	06/07/2012	6.74KB	☐	Download

Installing z/OS component

Requires currently supported version of z/OS

SMPE-based allowing CA MSM installation or pax-Enhanced ESD installation

SMPE delivers required software for z/OS, zVM and Linux on System z agents

Setup process requires that the CAIT72 target zone and the CAID72 distribution zone names be used

Installing z/OS component – cont'd

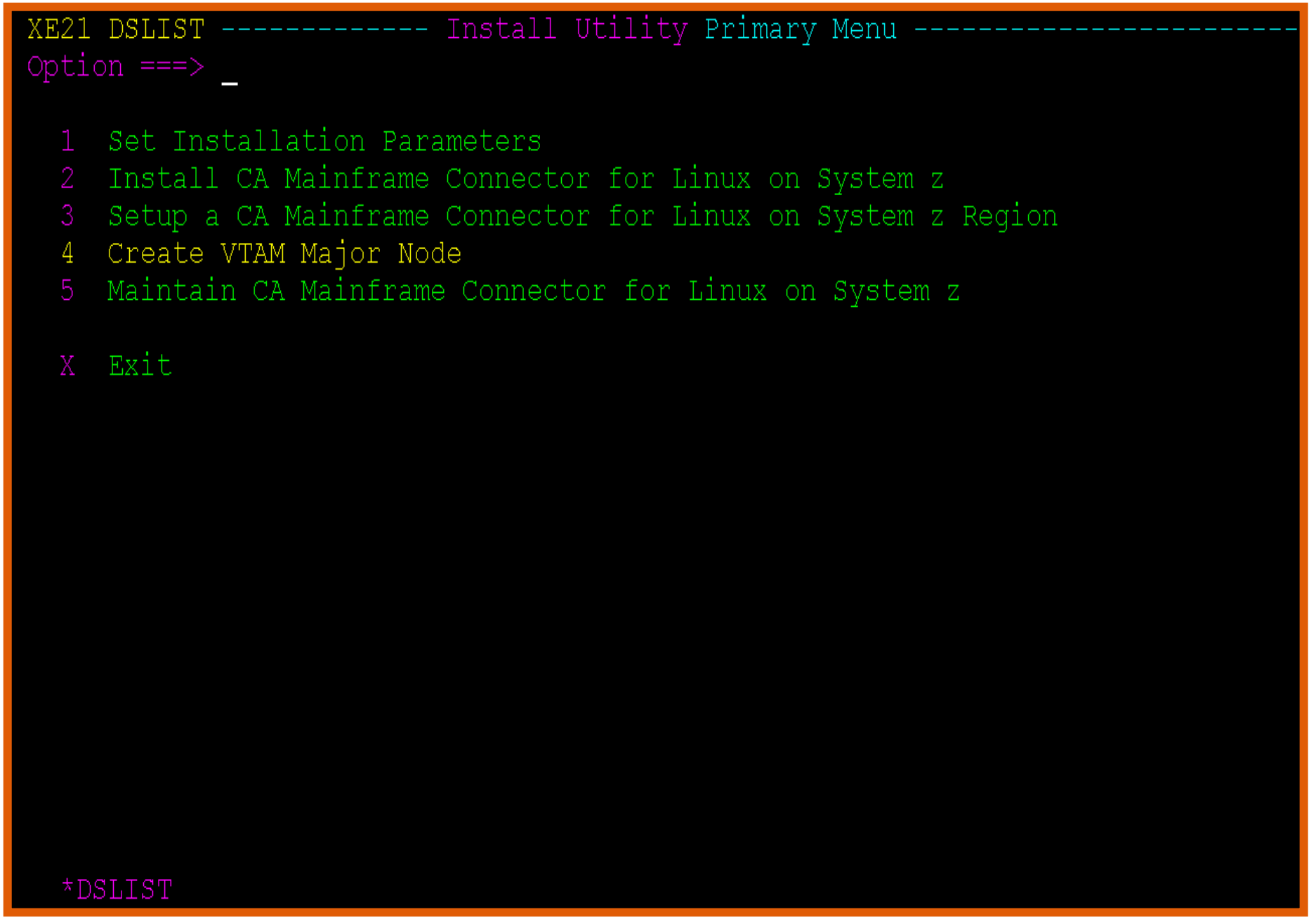
- Install-Deploy-Configure Linux Connector using CA MSM

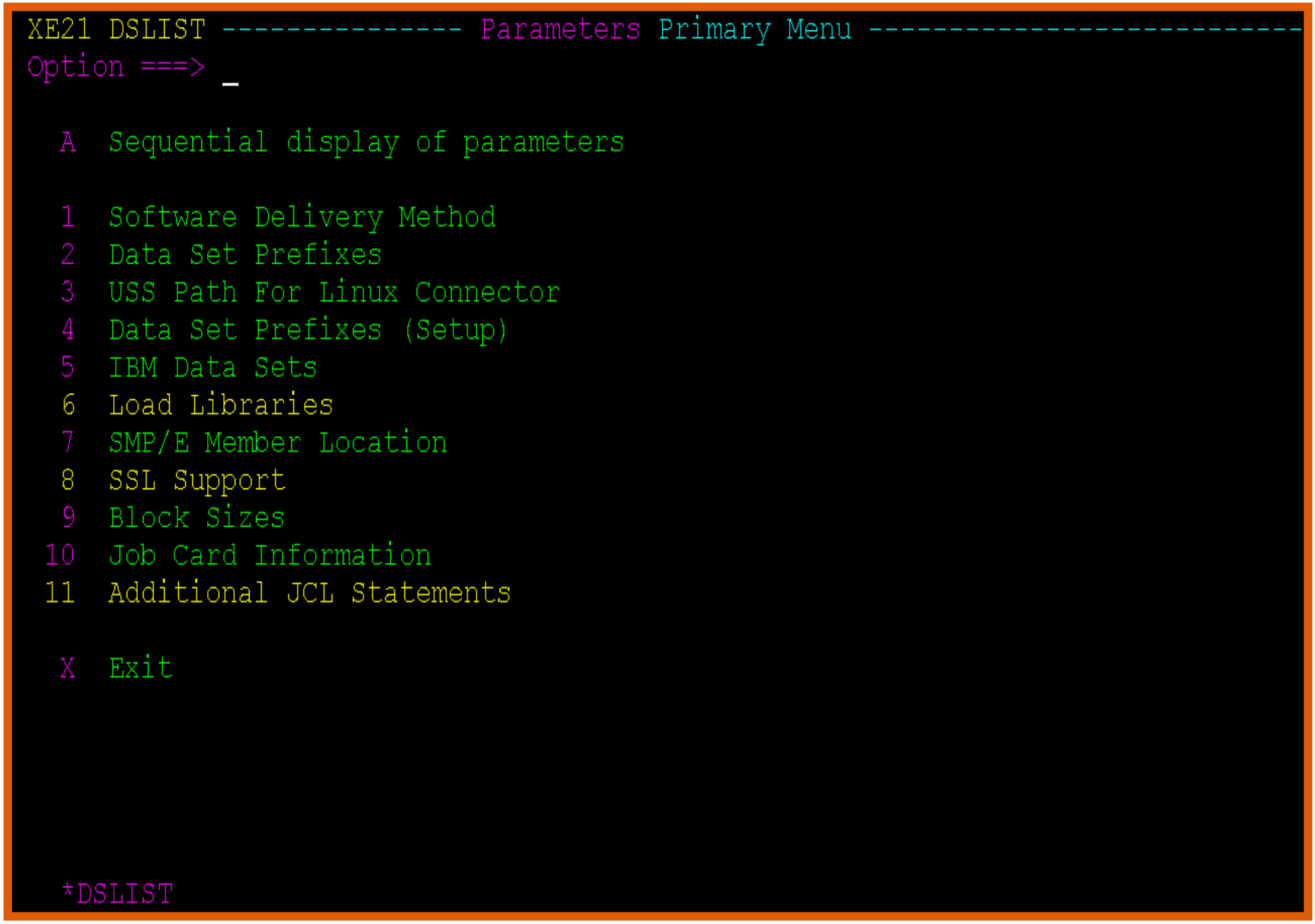
  OR

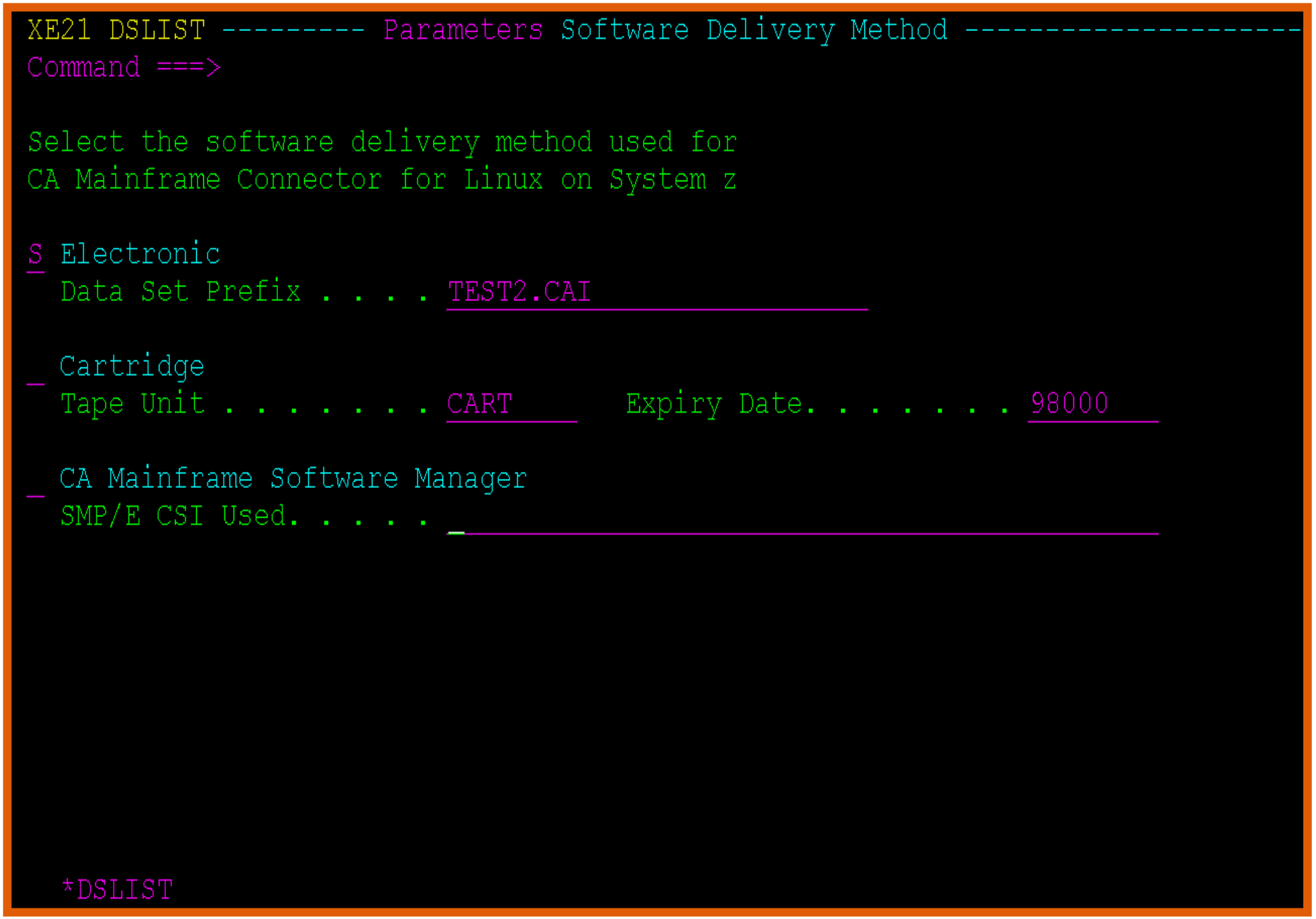
- Use Enhanced-ESD process to
  - Unpack the UNIX pax file
  - UNZIPJCL to execute GIMUNZIP to create MVS installation files
- After you unzip the data sets, do one of the following:
  - Rename dsnpref.CAI.LX10.CC2DJCL to dsnpref.LX10.CC2DJCL
  - Copy the members in dsnpref.CAI.LX10.CC2DJCL into dsnpref.LX10.CC2DJCL
- Ensure that the dsnpref.LX10.CC2DLINK data set is in your system LNKLST.
- Allocate a data set to ISPTABL DD (FB 80 PDS) for INSTALL utility

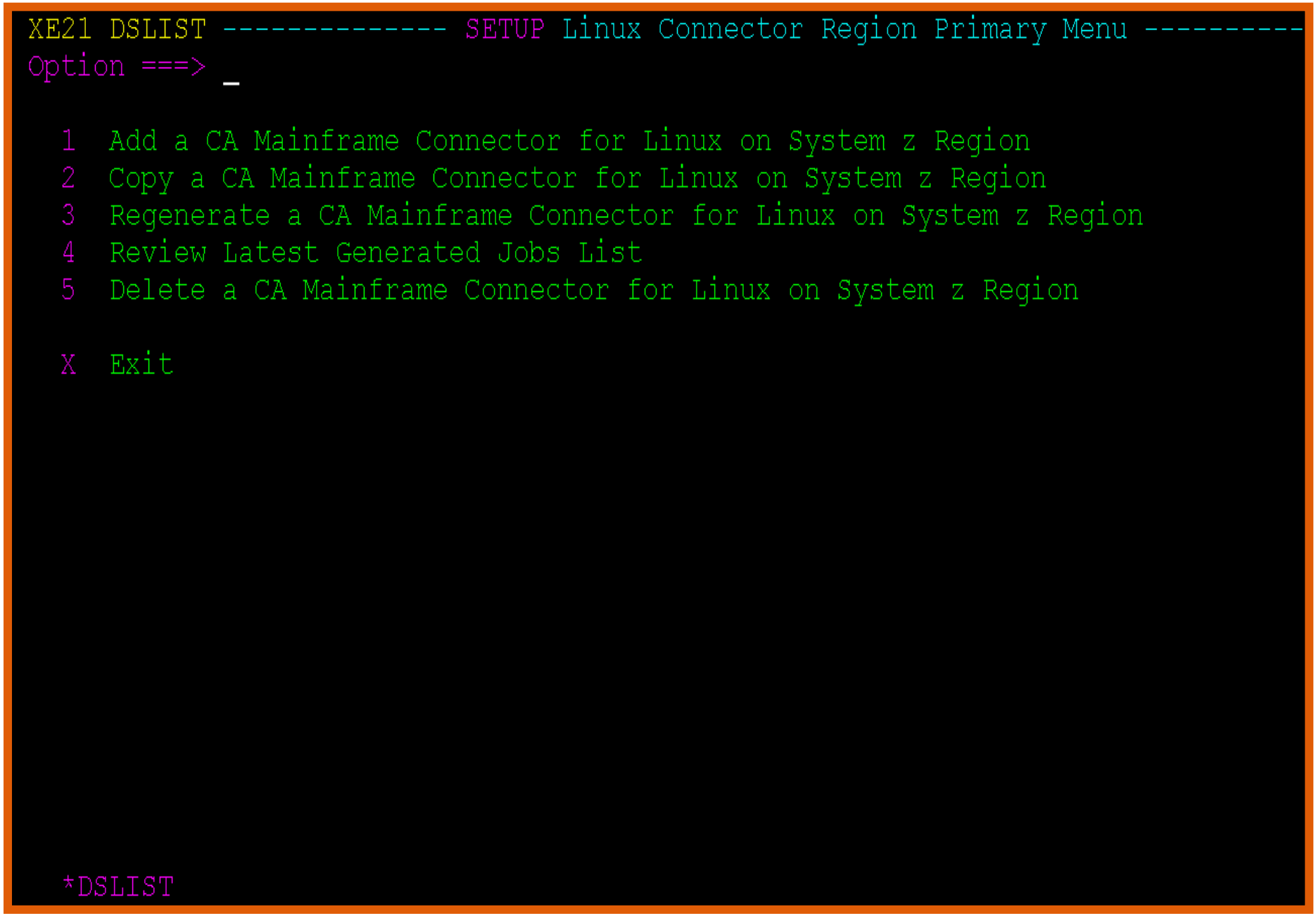
Installing z/OS component – cont'd

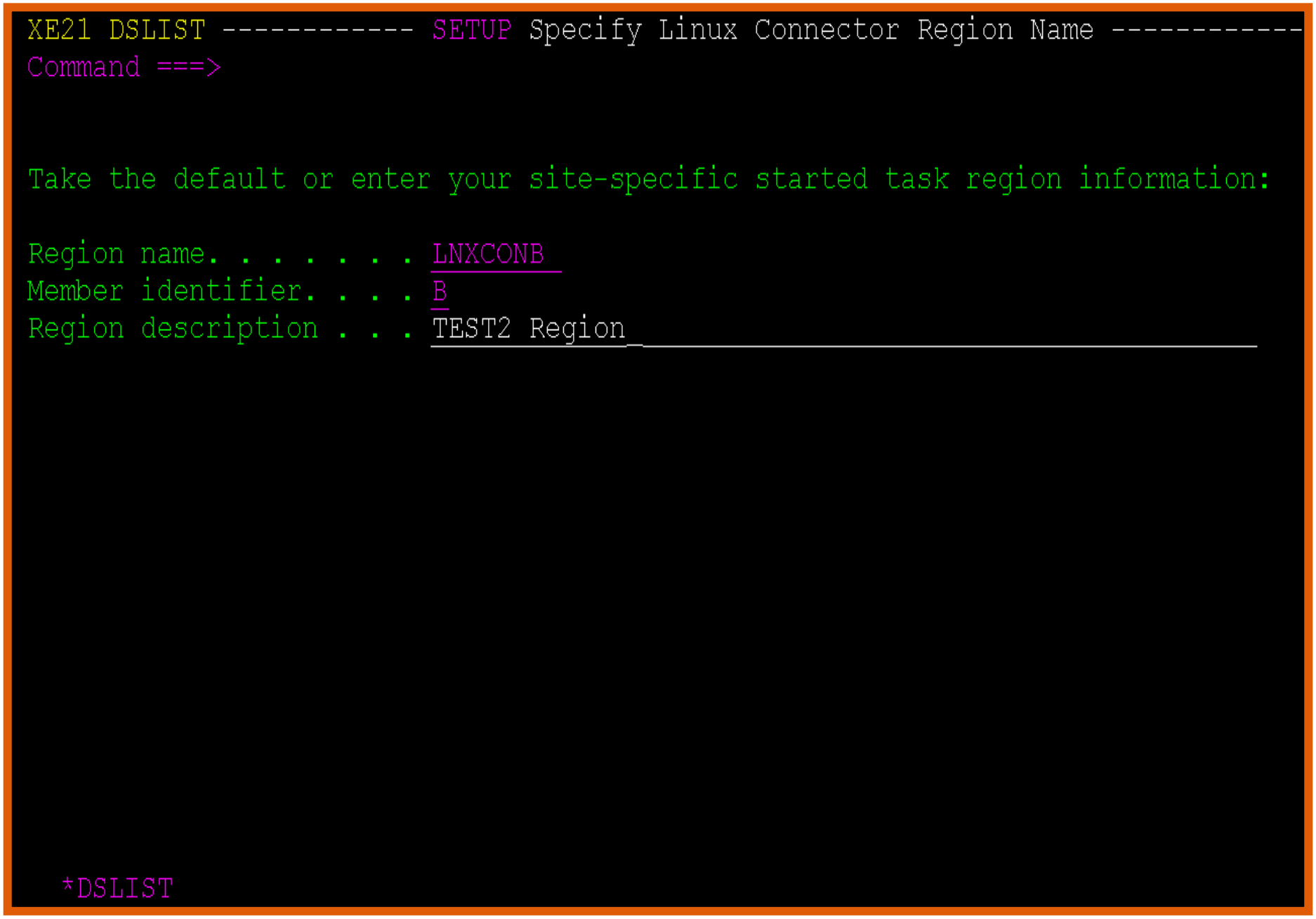
- Initiate Install Utility
  - EXEC 'dsnpref.LX10.CC2DJCL(INSTALL)'

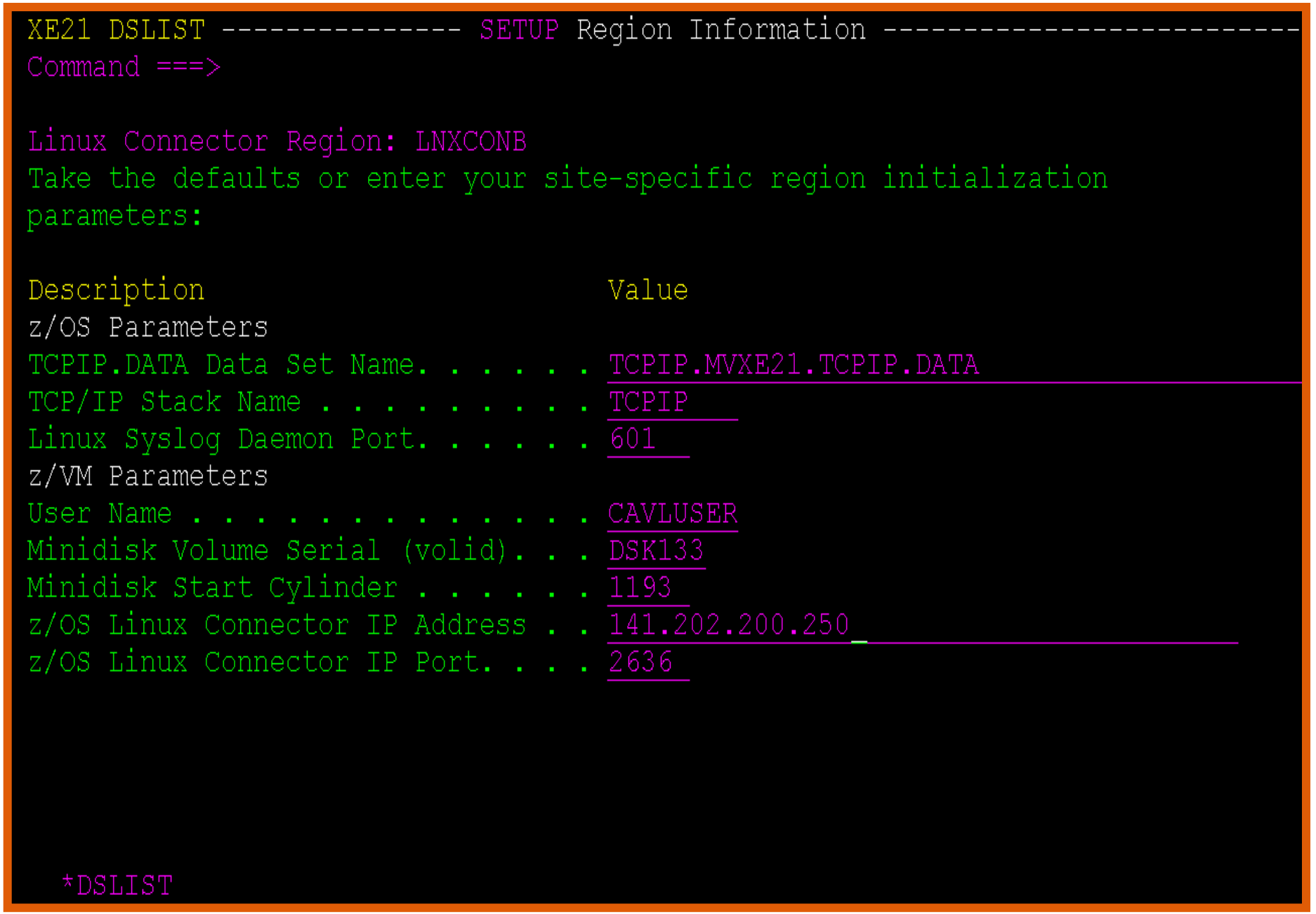


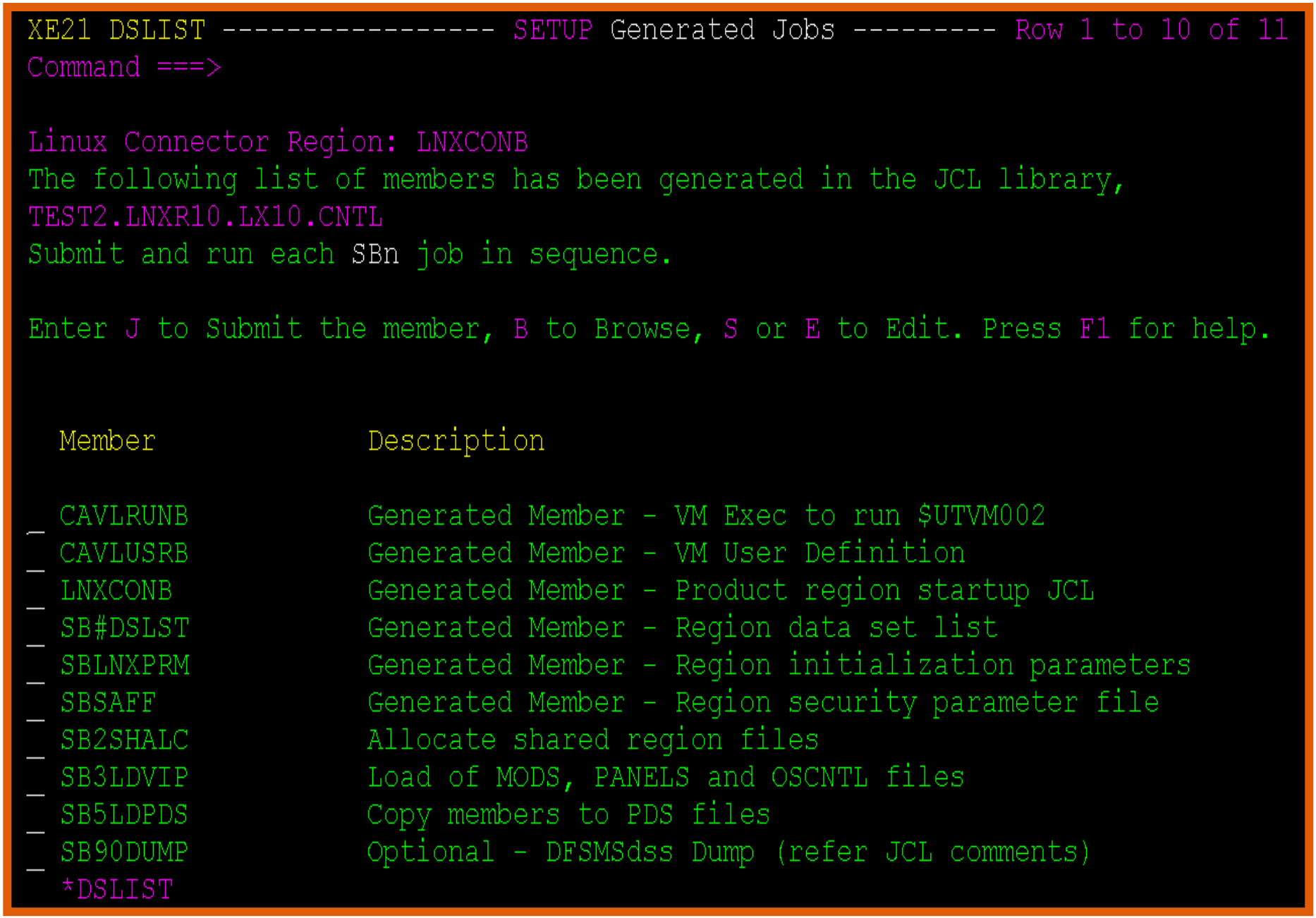


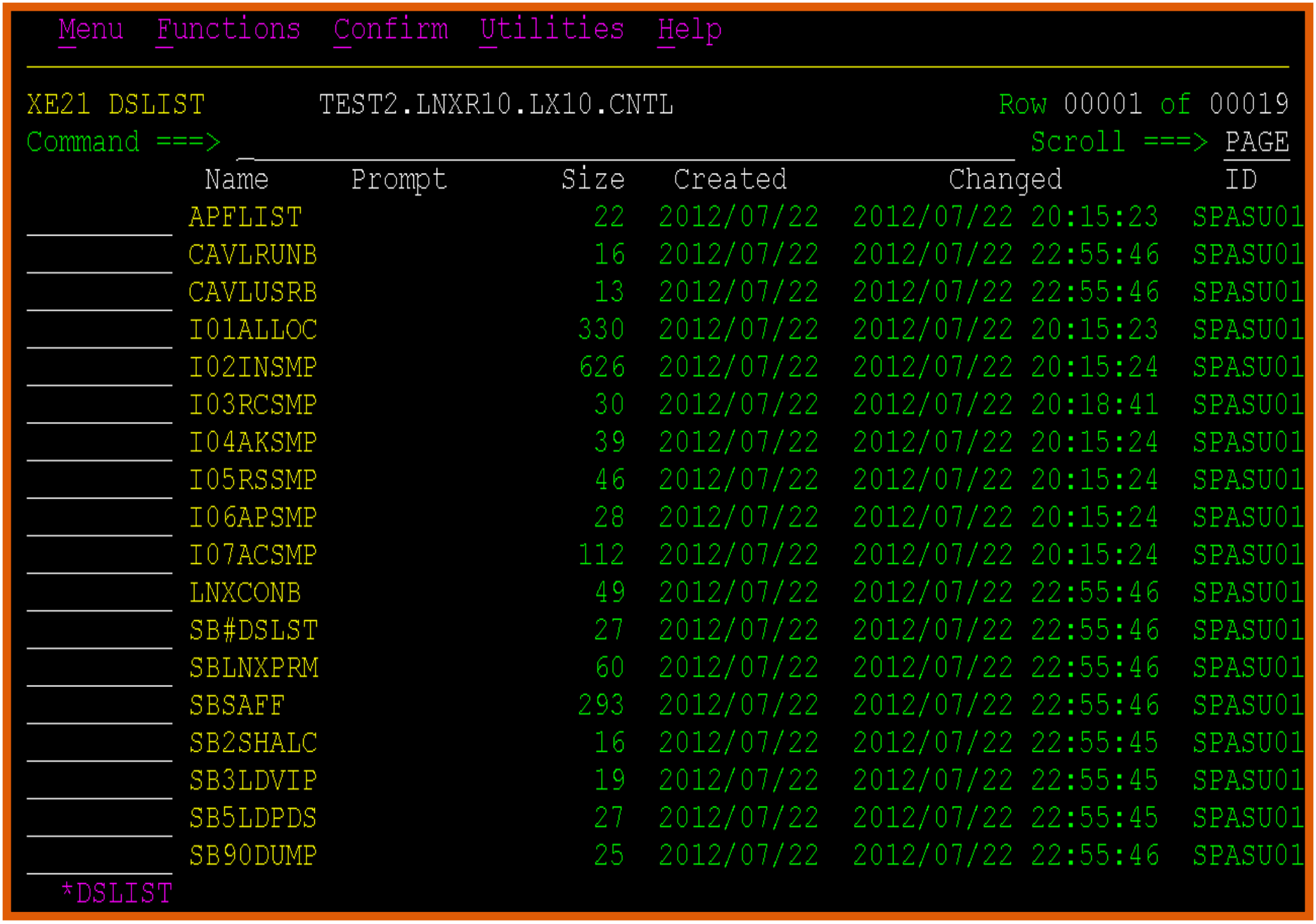












Installing z/OS component – cont'd
PARMLIB(S*i*LNXPRM)

ABENDCMD=S LNXCONN

STACKNAME=TCPIP21

STACKTYPE=IBM

IPPORT=3636

LXPORT=2636

SLPORT=514

CMDTOKEN=CALINUXCOMMANDS:

MSGTOKEN=CALINUXUNSOLMSG:

MULTICLIENT=NO

CMDPORT=

MSGPORT=

Installing z/OS component – cont'd
LNXCON STC Startup messages

LXIN0009 Stack Type set to IBM

LXIN0009 Stack Name set to TCPIP21

N3AT01 TCPIP START COMMAND PROCESSED

N00503 * LinuxCon INITIALIZATION COMPLETE LINUXCON ***

Installing z/VM agent

Software delivered as part of the z/OS component SMPE install

Requires currently supported version of z/VM

Requires either:
- Library for REXX on zSeries (5695-014)
- Alternate Library for REXX on zSeries Version 1.4.0 for use with z/VM

Installing z/VM agent

- Define a user ID for the z/VM agent to the z/VM system:
  - Log on to the user ID responsible for directory maintenance on the target z/VM system
  - Transfer the CAVLUSRi data set member to the 191 disk as agent_user_id DIRECT

Transfer required zVM components from z/OS

- dsnpref.LX10.CNTL(CAVLUSRi)
  - z/VM directory for the agent user ID
    - CMS file name: *agent_user_id*
    - CMS file type: DIRECT
  - Populated through INSTALL Utility or through CA MSM Configuration Services

Transfer required zVM components from z/OS

USER CAVLUSER password 64M 64M ABCG

IPL CMS

MACH ESA

SPOOL 000C 2540 READER *

SPOOL 000D 2540 PUNCH A

SPOOL 000E 1403 A

CONSOLE 009 3215 T

LINK MAINT 0190 0190 RR ← May need to change to meet your environment

LINK MAINT 019D 019D RR ← May need to change to meet your environment

LINK MAINT 019E 019E RR ← May need to change to meet your environment

LINK TCPMAINT 198 198 RR ← May need to change to meet your environment

LINK TCPMAINT 592 592 RR ← May need to change to meet your environment

MDISK 191 3390 1 003 *VOLIDX* MR ← VOLIDX is volume in your environment

Complete zVM Setup

- Define a user ID for the z/VM agent to the z/VM system:
  - Log on to the user ID responsible for directory maintenance on the target z/VM system
  - Transfer the CAVLUSRi data set member to the 191 disk as agent_user_id DIRECT
  - Customize the password in the directory to suit your requirements
  - Add the directory to the z/VM system directory
  - Install the changed directory using the DIRECTXA utility
- Log on to the agent user ID (CAVLUSERi)
- Transfer the other data set members to the 191 disk for the agent user ID

Transfer required zVM components from z/OS

- dsnpref.LX10.CNTL(CAVLRUNi)
  - REXX program that runs $UTVM002
  - Member contains the z/OS region IP address and port number specified during z/OS region setup
    - CMS file name: CAVLRUNA
    - CMS file type: EXEC
  - Populated through INSTALL Utility or through CA MSM Configuration Services

Transfer required zVM components from z/OS

```
/* Start the Linux Connector VM Agent */
ADDRESS COMMAND

/* Modify the following with the IP addr and port of Linux Connector */
ipAddr = “???.???.???.???"      ← IP address assigned to z/OS LNXCON STC
port = “?????"                  ← IP address assigned to z/OS LNXCON STC

"CP SET MSG ON"
"ACCESS 592 H"

EXEC "$UTVM002" ipaddr port

IF RC = 1 THEN
  PUSH "EXEC CAVLRUNA"

EXIT RC
```

Transfer required zVM components from z/OS)

- dsnpref.LX10.CE2JOBJ0(CAVLPROF)
  - Profile for the agent user ID
    - CMS file name: PROFILE
    - CMS file type: EXEC

```
/* Profile for CAVLAGNT */
ADDRESS COMMAND

"EXEC CAVLRUNA"

EXIT RC
```

Transfer required zVM components from z/OS)

- dsnpref.LX10.CE2JOBJ0(GENIUCVM)
  - REXX program that generates the IUCVMSG module
    - CMS file name: GENIUCVM
    - CMS file type: EXEC

Transfer required zVM components from z/OS

- dsnpref.LX10.CE2JOBJ0(IUCVMSG)
  - Inter-User Communications Vehicle (IUCV) message handler
    - CMS file name: IUCVMSG
    - CMS file type: TEXT
- dsnpref.LX10.CE2JOBJ0($UTVM002)
  - Compiled REXX program that is the agent
    - CMS file name: $UTVM002
    - CMS file type: EXEC

Important! Transfer the IUCVMSG and $UTVM002 members using the binary data type

Installing z/VM agent – cont'd

- Run the GENIUCVM EXEC
  - The IUCVMSG module is generated
- Logoff agent user ID
- XAUTOLOG agent user ID
- Add start of agent user ID to AUTOLOG1

Configure the Linux Syslog Daemon rsyslog

- Add the following statements in the /etc/rsyslog.conf file for the Linux system:

```
$WorkDirectory /var/spool/rsyslog          # where to place spool files
$ActionQueueFileName fwdRule1              # unique name prefix for spool files
$ActionQueueMaxDiskSpace 1g                # 1gb space limit (use as much as possible)
$ActionQueueSaveOnShutdown on              # save messages to disk on shutdown
$ActionQueueType LinkedList                # run asynchronously
$ActionResumeRetryCount -1                 # infinite retries if host is down
*.* @@[host_name]:601                      # host_name specifies the name or IP address
                                             of the z/OS system on which the z/OS region
                                             is running.
```

Note: You can change the port number, but the corresponding SLPORT value in the SiLNXPRM parameter member for the z/OS region must match.

- Restart rsyslog daemon with the new configuration

```
/etc/init.d/rsyslog restart
```

Configure the Linux Syslog Daemon syslog-ng

- Add the following statements in the /etc/syslog-ng.conf file for the Linux system:

  destination loghost { tcp("host_name" port(601)); };

  log { source(src); destination(loghost); };

  - host_name specifies the name or IP address of the z/OS system on which the z/OS region is running.
    - If you are using Internet Protocol Version 6 (IPv6), use the tcp6() driver instead of the tcp() driver
  - Note: You can change the port number, but the corresponding SLPORT value in the SiLNXPRM parameter member for the z/OS region must match

- Restart syslog-ng daemon with the new configuration

  /etc/init.d/syslog restart

Installing Linux agent

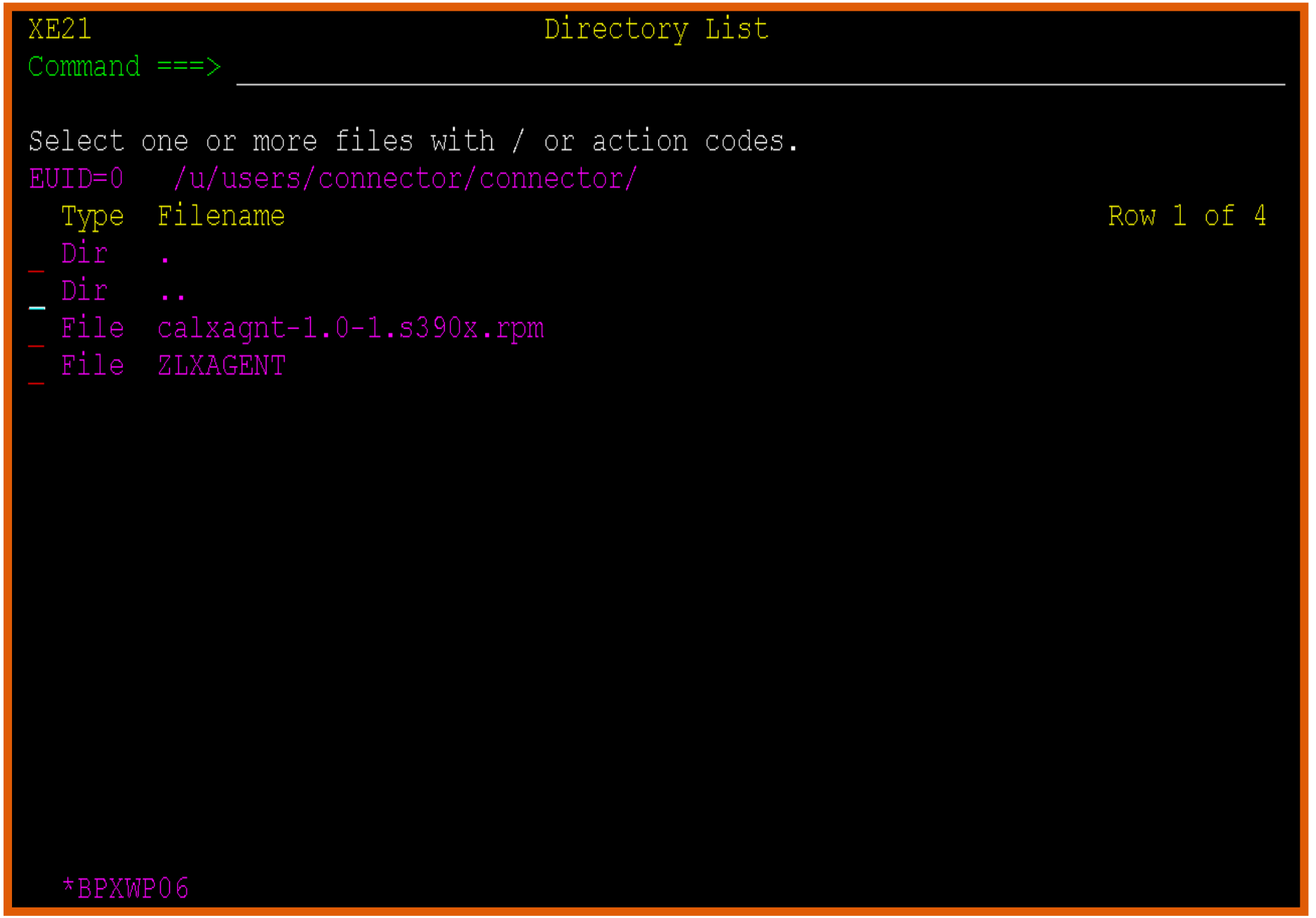
Software delivered as part of the z/OS component SMPE install in designated USS directory

Packaged in an RPM file

- calxagnt-v.r-1.s390x.rpm

Requires IBM-certified version of one of the following operating systems:

- Red Hat at minimum release level 6
- SuSE at minimum release level 11.1



Install the Linux agent

- Transfer calxagnt-1.0-1.s390x.rpm file to each zLinux server to be monitored in following directory:
  - For SuSE, /usr/src/packages/RPMS/s390x
  - For Red Hat, /usr/src/redhat/RPMS/s390x
- Install the Linux agent software using the following command:

  rpm -Uhv rpm_file_name

Configure the Linux agent

- Enable the Linux agent to issue z/VM CP commands:
  - Enter the following command:

    modprobe vmcp

    This allows the Linux agent can issue CP commands in the current session
- Add the command in the /etc/init.d/boot.local (SuSE) or /etc/rc.local (Red Hat) file.

  The Linux agent can issue CP commands the next time the Linux system starts

Configure the Linux agent – cont'd

- **Update the SOLVE service in the xinetd configuration:**
  - **Create a file, named solve, in the /etc/xinetd.d directory, using the following name for the server program:**

    /usr/sbin/calxagnt
  - **Sample SOLVE Service file:**

```
#Linux Agent for CA Mainframe Connector
service SOLVE
{
socket_type = stream
protocol = tcp
wait = no
user = root
server = /usr/sbin/calxagnt
}
```

Note: If you are using SuSE, you can use YaST (Yet another Setup Tool) to create this file

Configure the Linux agent – cont'd

- If root privilege is not required, change the user under which the agent runs
- (Optional) Add the following server argument to run the agent from a home directory:

  server_args = -d home_directory_path
- Enter the following command to restart the xinetd daemon:

  service xinetd restart

Communication between the Linux agent and the z/OS region is configured

With CA OPS/MVS R12.0 or higher

CA OPS/MVS
Configuration for Mainframe Connector

- **INITLXC = YES/NO**
  - Starts the unsolicited message subtask processing at CA OPS/MVS initialization
  - **F OPSx,RESTART(LXC)** is the CA OPS/MVS command to restart or stop the unsolicited message subtask
- **BROWSELXC = YES/NO**
  - Controls whether unsolicited z/VM and Linux on System z message event records are written to OPSLOG
- **LXCRULES = YES/NO**
  - Enables)API LX* rules for unsolicited z/VM and Linux on System z messages
    - LXLOG001I for Linux on System z
    - LXMSG001I for z/VM
    - LXEVT001I for z/VM event message

CA OPS/MVS
Configuration for Mainframe Connector (cont.)

Parameters must match the corresponding values specified in the Connector for Linux region

- **LXCONMSG = 'CALINUXUNSOLMSG:'**
  - Name of z/OS name token pair containing the IP port number of Connector for Linux region message task
- **LXCONCMD = 'CALINUXCOMMANDS:'**
  - Name of z/OS name token pair containing the IP port number of Connector for Linux region command task

NOTE the colons are part of the name!

CA OPS/MVS
ADDRESS LXCON OPS/REXX Host Command

Executes from within one of CA OPS/MVS's USS servers

- VMCMD VMNODE(***nodename***) COMMAND('command text') WAIT(seconds) STEM(stem)
- LXCMD LINUX(***linuxname***) VMNODE(***nodename***) COMMAND('command text') WAIT(seconds) STEM(stem)
- ***nodename*** and ***linuxname*** values are determined via topology messages sent to the unsolicited message subtask when
  - Connection is started
  - New systems are added after our connection is already active
  - Values will be put into a structured format for use with ADDRESS LXCON
- **WAIT** ignored if command initiated from an AOF rule

CA OPS/MVS
ADDRESS LXCON OPS/REXX Host Command

Executes from within the CA OPS/MVS address space

- LIST LINUX(***linuxname****) VMNODE(***nodename****)
  - Gathers topology data received from the Connector for Linux Region
  - Put records of topology data for matching LINUX and/or VMNODE names into the REXX EDQ
  - **Available as resource data for System State Manager (SSM)**

CA OPS/MVS
AOF Generic API events

- LXC events are presented as AOF Generic API events
- Only an activated CA OPS/MVS API interface can process the LXC message events
  - To activate the AOF API interface, set the APIACTIVE parameter to YES
    - **OPSPRM('SET','APIACTIVE','YES')**

CA Mainframe Connector for Linux on System z
Linux Connector API Rules

- CA OPS/MVS Linux Connector interface (LXCON) connects with the Linux Connector component through a local IP connection
- This interface delivers unsolicited message events from monitored VM and Linux systems as normalized messages that are processed as CA OPS/MVS API events
- Write API rules that specify how CA OPS/MVS can respond to these Linux and VM events
- Typically, the System State Manager (SSM) component of CA OPS/MVS is used to monitor and control the availability of Linux systems that run as VM guest computers

CA Mainframe Connector for Linux on System z
Linux Connector API Rules

- The Address LXCON host command can be used to display any connected VM and Linux systems and to issue commands to the systems
- Every Linux Connector API event ID begins with a common prefix
  - *LX*
  - Write individual API rules for specific LXCON events
  - Write a single rule for all events
    -)API LX*

CA Mainframe Connector for Linux on System z
Linux Connector API Rules

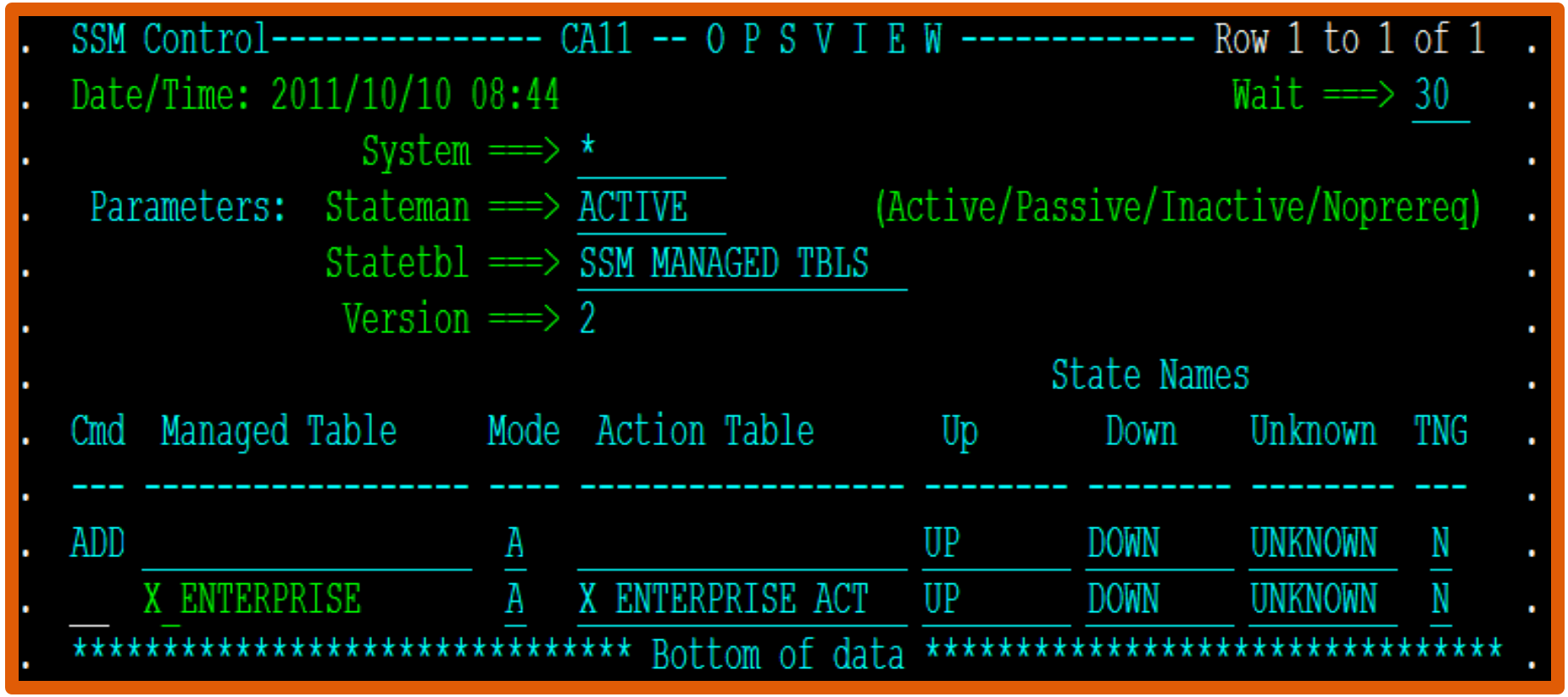
- **Z/VM Messages**
  - **Description:**
    - LXMSG001I z/VM-node message-type user ID message-text
  - **Example**
    - LXMSG001I ZVM002 MSG POLLGEN NMVM0001 00:34:49 Hello
- **Z/VM Events**
  - **Description**
    - LXEVT001I z/VM-node user ID event-type
  - **Example**
    - LXEVT001I ZVM002 LINUX113 RUNNABLESTATEENABLED

CA Mainframe Connector for Linux on System z
Linux Connector API Rules

- **Linux Syslog-ng Messages**
  - **Description**
    - LXLOG001I Linux-name z/VM-host facility severity message-text
  - **Example**
    - LXLOG001I LINUX113 ZVM002 user notice logger: Test Message

Linux Resources in CA OPS/MVS Guests and Applications

— One cross-enterprise SSM table



Linux Resources in CA OPS/MVS Guests and Applications

— One cross-enterprise SSM table

Table Data Editor ---------- X_ENTERPRISE ---------- COLU

COL--> NAME	SYSTEM	CURRENT_STATE	DESIRED_STATE	MODE	PREMODE	REFMODE	ACTMODE	SCHEDMODE	PREREQ
******	**********	**********	**********	TOP OF DATA	**********	**********	**********	**********	**********
000001 CICSRGN1	CA11	FAILED	UP	ACTIVE	ACTIVE	ACTIVE	ACTIVE	ACTIVE	NULL
000002 DB2ADIST	CA11	UP	UP	ACTIVE	ACTIVE	ACTIVE	ACTIVE	ACTIVE	NULL
000003 DB2AIRLM	CA11	UP	UP	ACTIVE	ACTIVE	ACTIVE	ACTIVE	ACTIVE	NULL
000004 DB2AMSTR	CA11	UP	UP	ACTIVE	ACTIVE	ACTIVE	ACTIVE	ACTIVE	NULL
000005 JES2	CA11	UP	UP	ACTIVE	ACTIVE	ACTIVE	ACTIVE	ACTIVE	NULL
000006 LINUX201	ZVM011	UP	UP	ACTIVE	ACTIVE	ACTIVE	ACTIVE	ACTIVE	NULL
000007 LINUX201.FTP	ZVM011	STOPPING	DOWN	ACTIVE	ACTIVE	ACTIVE	RECYCLE	ACTIVE	NULL
000008 LINUX201.ORACLE	ZVM011	UP	UP	ACTIVE	ACTIVE	ACTIVE	ACTIVE	ACTIVE	NULL
000009 LINUX202	ZVM011	UP	UP	ACTIVE	ACTIVE	ACTIVE	ACTIVE	ACTIVE	NULL
000010 LINUX202.ITPAM	ZVM011	STARTING	UP	ACTIVE	ACTIVE	ACTIVE	ACTIVE	ACTIVE	NULL
000011 LINUX202.SAPHR	ZVM011	UP	UP	ACTIVE	ACTIVE	ACTIVE	ACTIVE	ACTIVE	NULL
000012 LINUX203	ZVM011	DOWN	DOWN	ACTIVE	ACTIVE	ACTIVE	ACTIVE	ACTIVE	NULL
000013 LINUX203.DSERIES	ZVM011	DOWN	DOWN	ACTIVE	ACTIVE	ACTIVE	ACTIVE	ACTIVE	NULL
000014 NET	CA11	UP	UP	ACTIVE	ACTIVE	ACTIVE	ACTIVE	ACTIVE	NULL
******	**********	**********	**********	BOTTOM OF DATA	**********	**********	**********	**********	**********

Linux Resources in CA OPS/MVS Guests and Applications

— One cross-enterprise SSM table

```
SSM Resource Status---------- CA11 -- O P S V I E W -------  Exceptions exist
Date/Time: 2011/10/10 08:42                          Filtered: Y   View ===> ALL
System: *        SSM Mode: ACTIVE   Version: 2                     Wait ===> 30
Disp: E (B/V/E)                States                Modes
Cm Sta Resource Name      Current  Desired  Res Pre Ref Tng Action   Message
-- --- ----------------- -------- -------- --- --- --- --- -------- ----------
     W CICSRGN1           FAILED   UP       A   A   A   .  ACTIVE   Transition
       DB2ADIST           UP       UP       A   A   A   .  ACTIVE
       DB2AIRLM           UP       UP       A   A   A   .  ACTIVE
       DB2AMSTR           UP       UP       A   A   A   .  ACTIVE
       JES2               UP       UP       A   A   A   .  ACTIVE
       LINUX201           UP       UP       A   A   A   .  ACTIVE
     W LINUX201.FTP       STOPPING DOWN     A   A   A   .  RECYCLE  Transition
       LINUX201.ORACLE    UP       UP       A   A   A   .  ACTIVE
       LINUX202           UP       UP       A   A   A   .  ACTIVE
     W LINUX202.ITPAM     STARTING UP       A   A   A   .  ACTIVE   Transition
       LINUX202.SAPHR     UP       UP       A   A   A   .  ACTIVE
       LINUX203           DOWN     DOWN     A   A   A   .  ACTIVE
       LINUX203.DSERIES   DOWN     DOWN     A   A   A   .  ACTIVE
       NET                UP       UP       A   A   A   .  ACTIVE
****************************** Bottom of data ********************************
```

Linux Resources in CA OPS/MVS Guests and Applications

```
SSM Control--------------- CA11 -- O P S V I E W ------------ Row 1 to 3 of 3
Date/Time: 2011/10/10 08:54                                    Wait ===> 30
               System ===> *
 Parameters:  Stateman ===> ACTIVE          (Active/Passive/Inactive/Noprereq)
              Statetbl ===> SSM MANAGED TBLS
               Version ===> 2
                                                    State Names
Cmd  Managed Table     Mode  Action Table       Up       Down     Unknown  TNG
--- ----------------- ---- ----------------- -------- -------- -------- ---
ADD                    A                      UP       DOWN     UNKNOWN  N
__  LINUX_APPLS       A     LINUX ACT        UP       DOWN     UNKNOWN  N
__  LINUX_GUESTS      A     LINUX ACT        UP       DOWN     UNKNOWN  N
__  STCTBL            A     STCTBL ACT       UP       DOWN     UNKNOWN  N
****************************** Bottom of data ********************************
```

- Unique table for each type of resource
  - ✓LINUX_APPLS
  - ✓LINUX_GUESTS
  - ✓STCTBL

```
Table Data Editor ---------- LINUX_APPLS ------------------------------------------------------------------- COLUM
COL--> NAME            SYSTEM   CURRENT_STATE DESIRED_STATE MODE     PREMODE  REFMODE  ACTMODE  SCHEDMODE PREREQ
****** ***************************************************** TOP OF DATA ***************************************
000001 LINUX201.FTP    ZVM011   UP            UP            ACTIVE   ACTIVE   ACTIVE   ACTIVE   ACTIVE    NULL
000002 LINUX201.ORACLE ZVM011   UP            UP            ACTIVE   ACTIVE   ACTIVE   ACTIVE   ACTIVE    NULL
000003 LINUX202.ITPAM  ZVM011   STOPPING      DOWN          ACTIVE   ACTIVE   ACTIVE   RECYCLE  ACTIVE    NULL
000004 LINUX202.SAPHR  ZVM011   FAILED        UP            ACTIVE   ACTIVE   ACTIVE   ACTIVE   ACTIVE    NULL
000005 LINUX203.DSERIES ZVM011  DOWN          DOWN          ACTIVE   ACTIVE   ACTIVE   ACTIVE   ACTIVE    NULL
****** ***************************************************** BOTTOM OF DATA ************************************
```

Linux Resources in CA OPS/MVS Guests and Applications

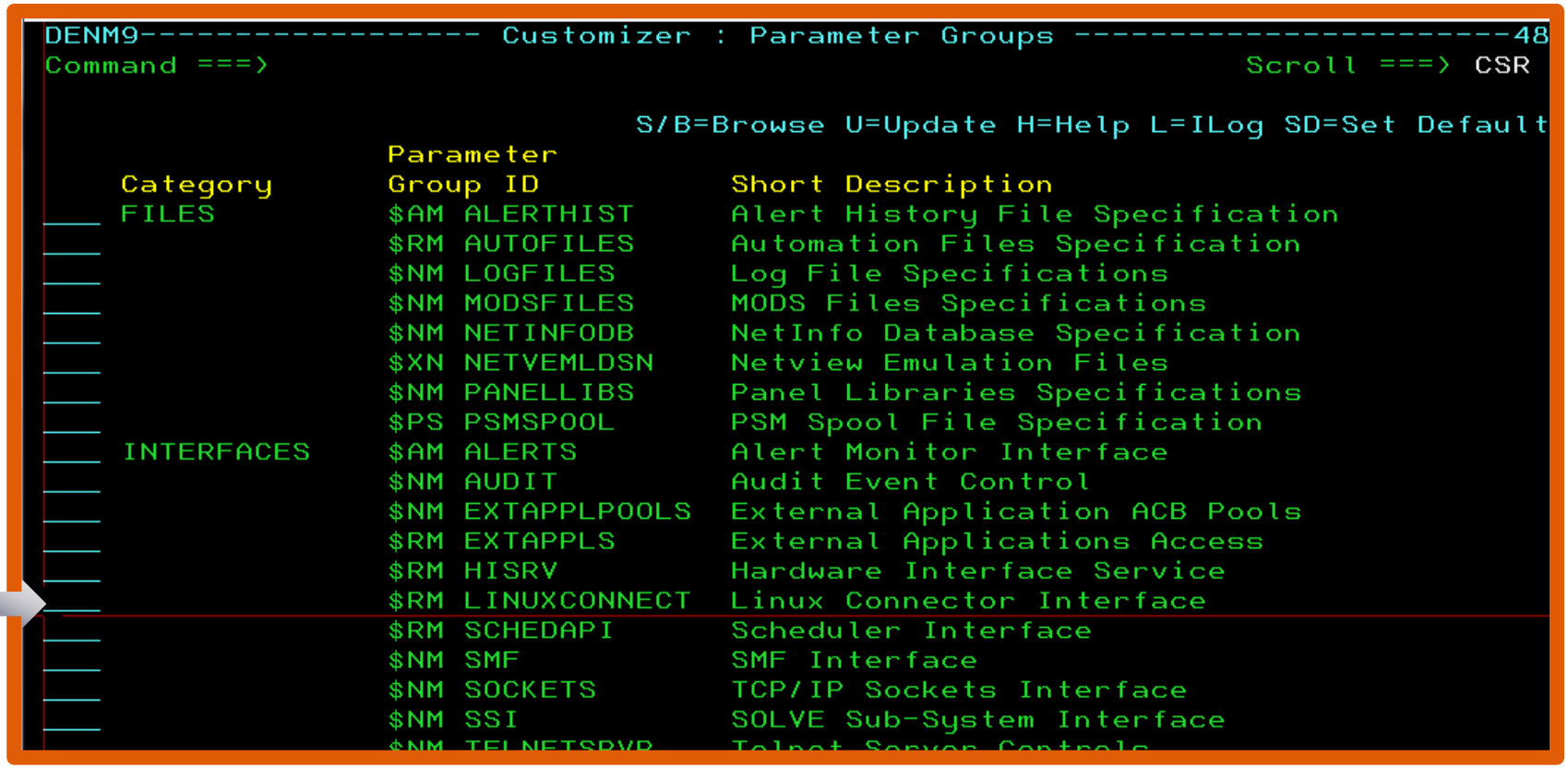
- OPSVIEW brings together resources from LINUX_APPLS, LINUX_GUESTS, STCTBL tables

```
SSM Resource Status---------- CA11 -- O P S V I E W -------  Exceptions exist
Date/Time: 2011/10/10 08:53                          Filtered: N   View ===> ALL
System: *        SSM Mode: ACTIVE   Version: 2                     Wait ===> 30
Disp: E (B/V/E)                States                Modes
Cm Sta Resource Name      Current  Desired  Res Pre Ref Tng Action   Message
-- --- ------------------ -------- -------- --- --- --- --- -------- ----------
__      LINUX201          ACTIVE   ACTIVE   A   A   A   .  ACTIVE
__      LINUX202          ACTIVE   ACTIVE   A   A   A   .  ACTIVE
__    W LINUX203          FAILED   ACTIVE   A   A   A   .  ACTIVE   Exception
__      LINUX204          INACTIVE INACTIVE A   A   A   .  ACTIVE
__      LINUX201.FTP      UP       UP       A   A   A   .  ACTIVE
__      LINUX201.ORACLE   UP       UP       A   A   A   .  ACTIVE
__    W LINUX202.ITPAM    STOPPING DOWN     A   A   A   .  RECYCLE  Transition
__    W LINUX202.SAPHR    FAILED   UP       A   A   A   .  ACTIVE   Transition
__      LINUX203.DSERIES  DOWN     DOWN     A   A   A   .  ACTIVE
__    W CICSRGNA          TIMEOUT  UP       N   A   A   .  ACTIVE   Transition
__    W DB2ADIST          STARTING UP       N   A   A   .  ACTIVE   Transition
__      DB2AIRLM          UP       UP       N   A   A   .  ACTIVE
__      DB2AMSTR          UP       UP       N   A   A   .  ACTIVE
__      JES2              UP       UP       N   A   A   .  ACTIVE
__      NET               UP       UP       N   A   A   .  ACTIVE
******************************** Bottom of data ********************************
```

With CA SOLVE:Operations R11.9 or higher

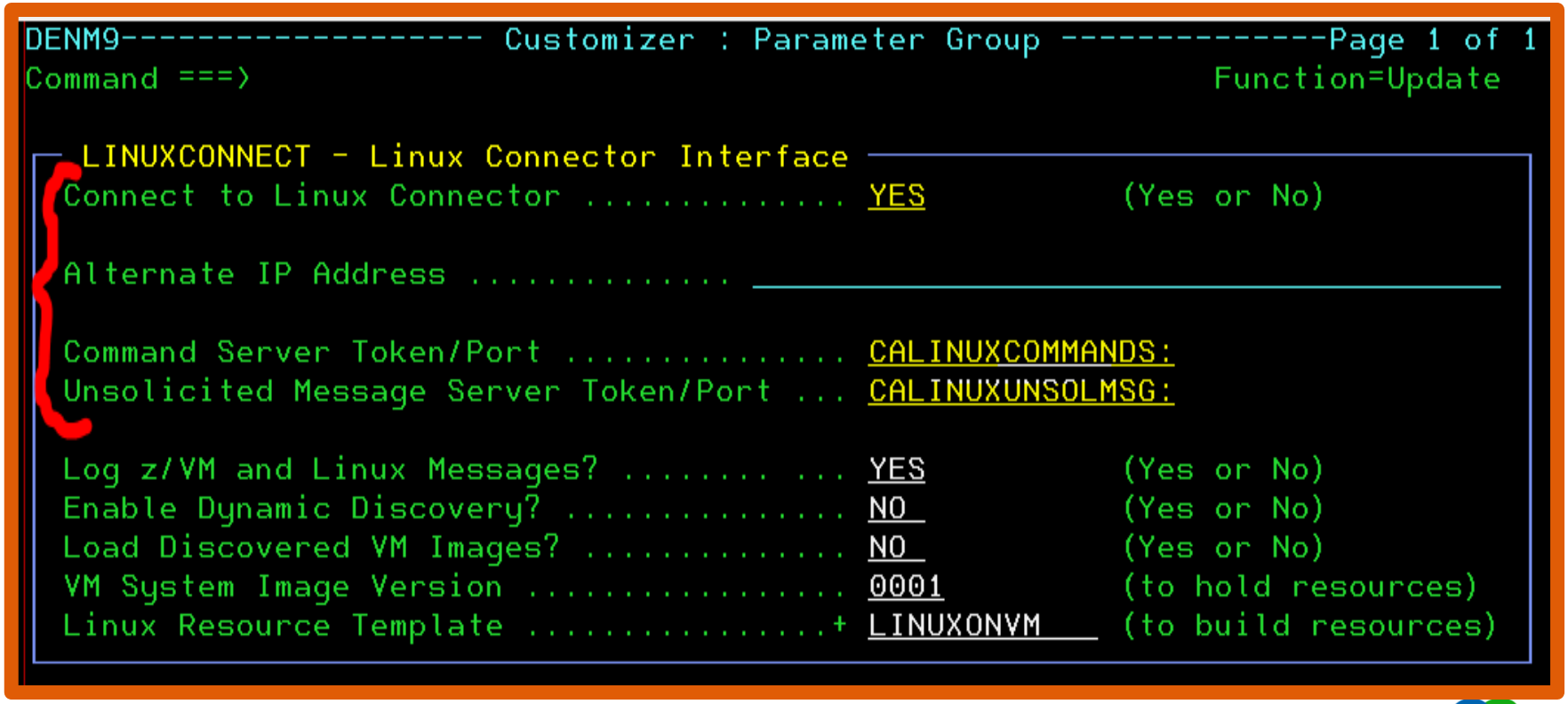
CA SOLVE:Operations Configuration for Mainframe Connector

— System Administrators are able to configure how, or even if, CA SOLVE:Operations connects via the LINUXCONNECT parameter group



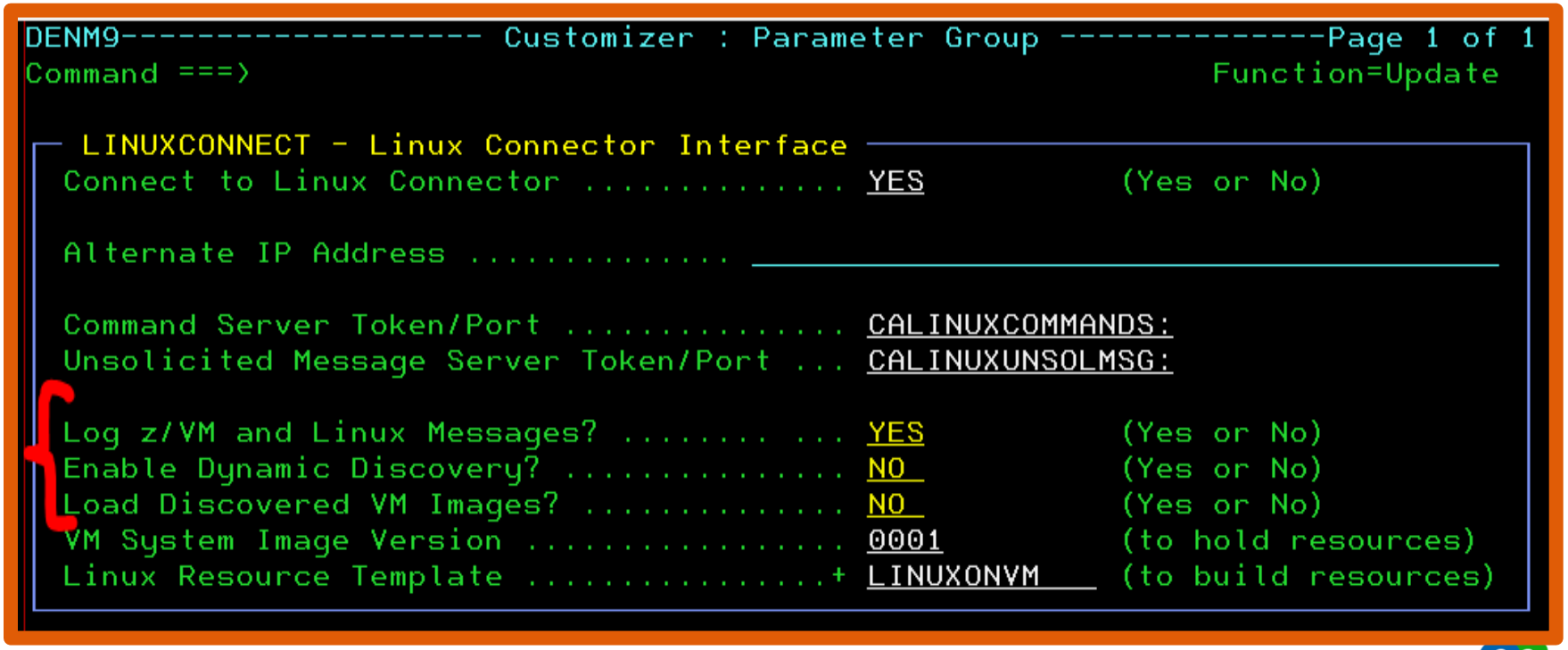
CA SOLVE:Operations
Configuration for Mainframe Connector (cont.)

- Define system tokens or ports that CA SOLVE:Operations will use to connect
- Define an alternate IP Address if Connector for Linux region is contactable via a different host



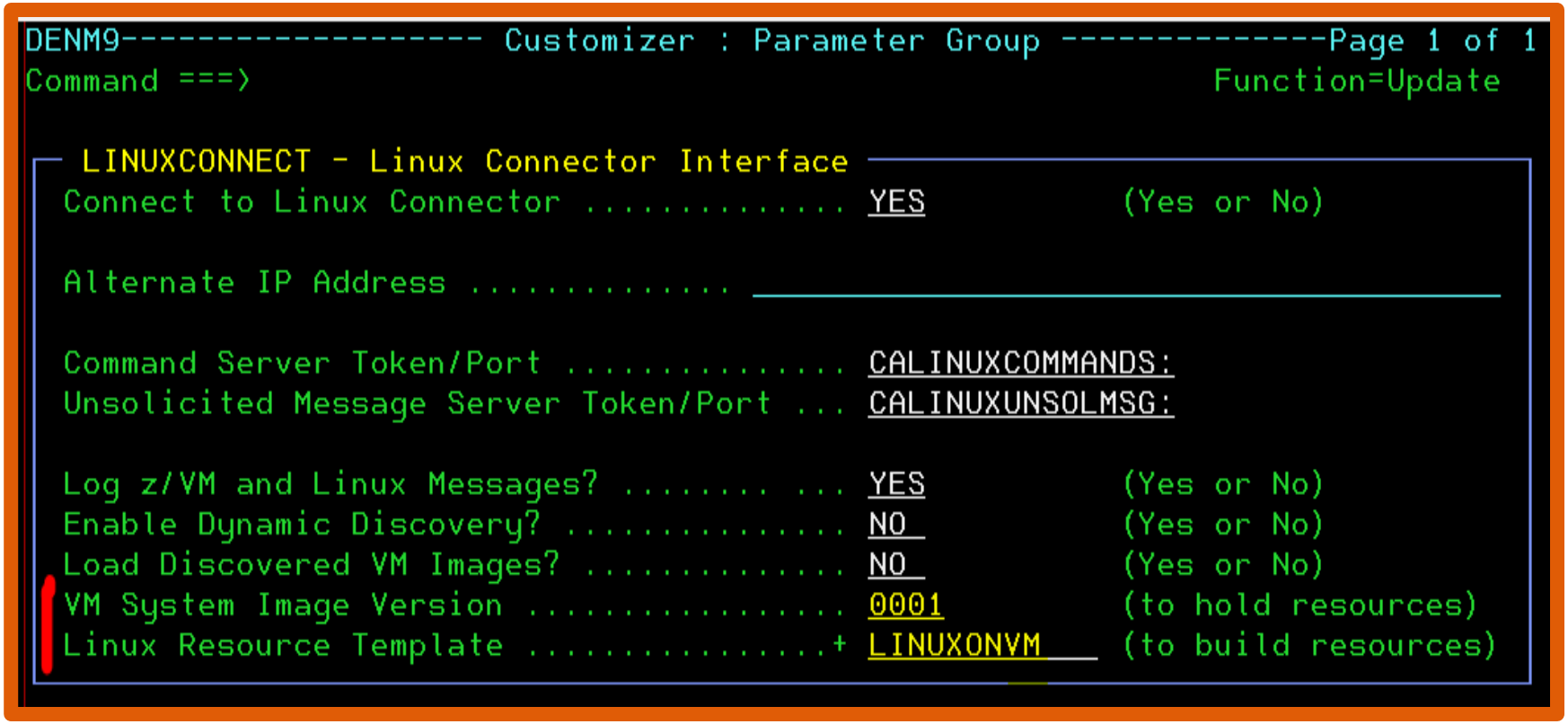
CA SOLVE:Operations
Configuration for Mainframe Connector (cont.)

- Administrators are able to
  - Enable/disable dynamic discovery of z/VM and Linux on System z systems
  - Choose whether discovered images are loaded immediately or just defined for later inspection



CA SOLVE:Operations
Configuration for Mainframe Connector (cont.)

— The last two parameters allow users to define the default system image version for discovered z/VM System Images and also the template to use when adding discovered Linux on System z systems



CA SOLVE:Operations
Automatic Discovery of z/VM System Images

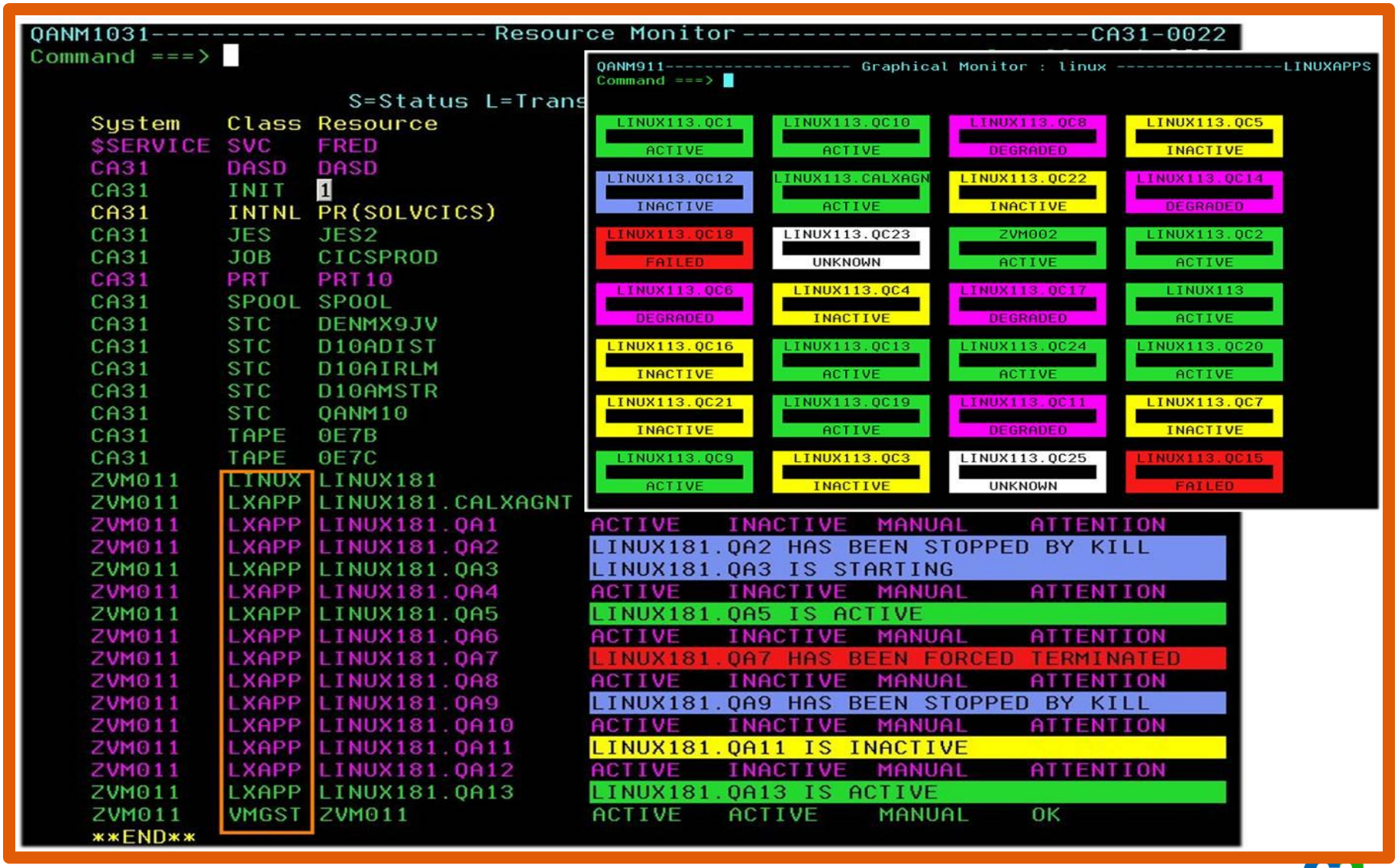
- New System Images

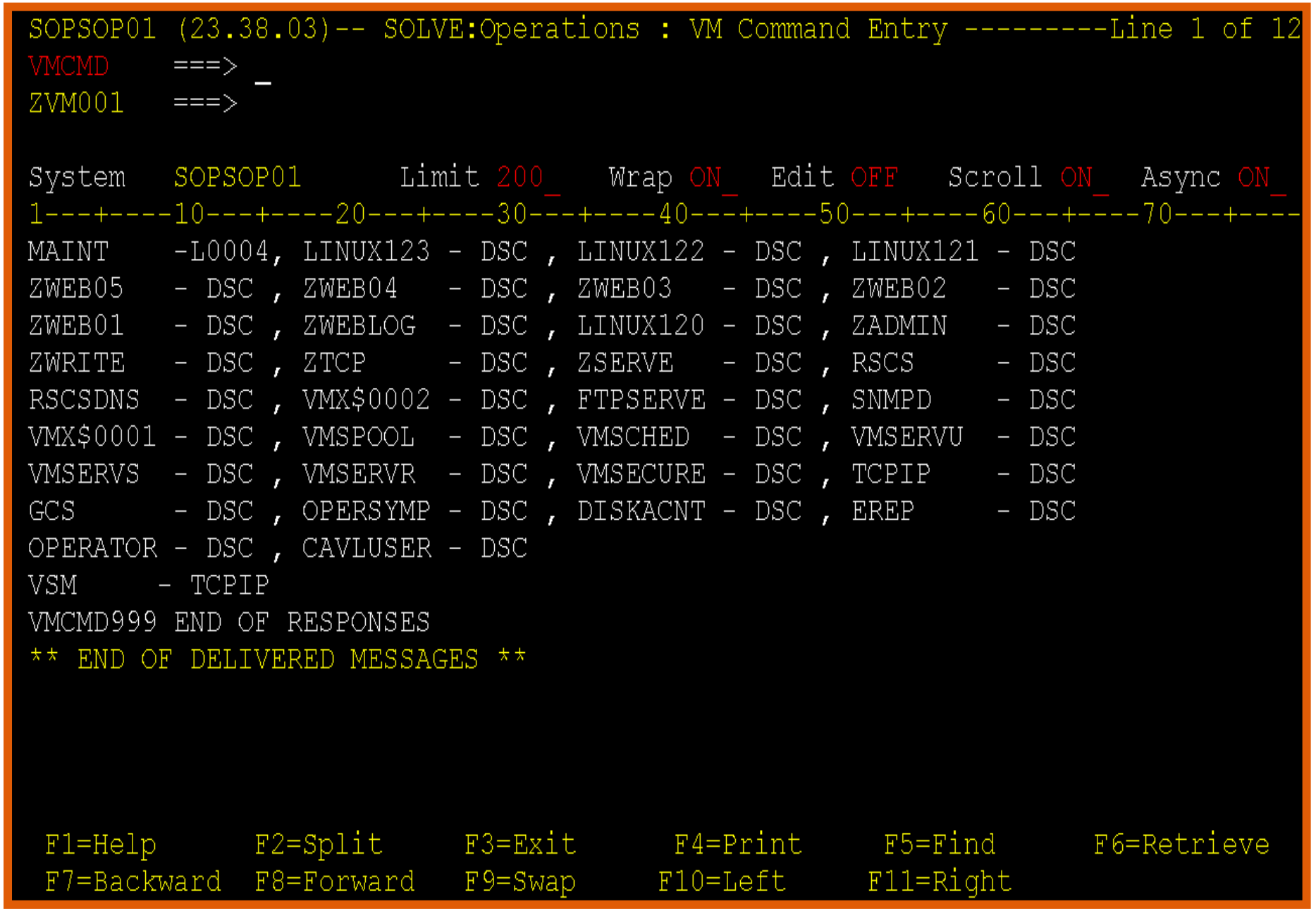
```
DENM9-------- Automation Services : System Image --
Select Option ===>
   L    - Local System Images
   SHR  - Shared System Images
   SPX  - Sysplex System Images
   VM   - VM System Images
   X    - Exit
```

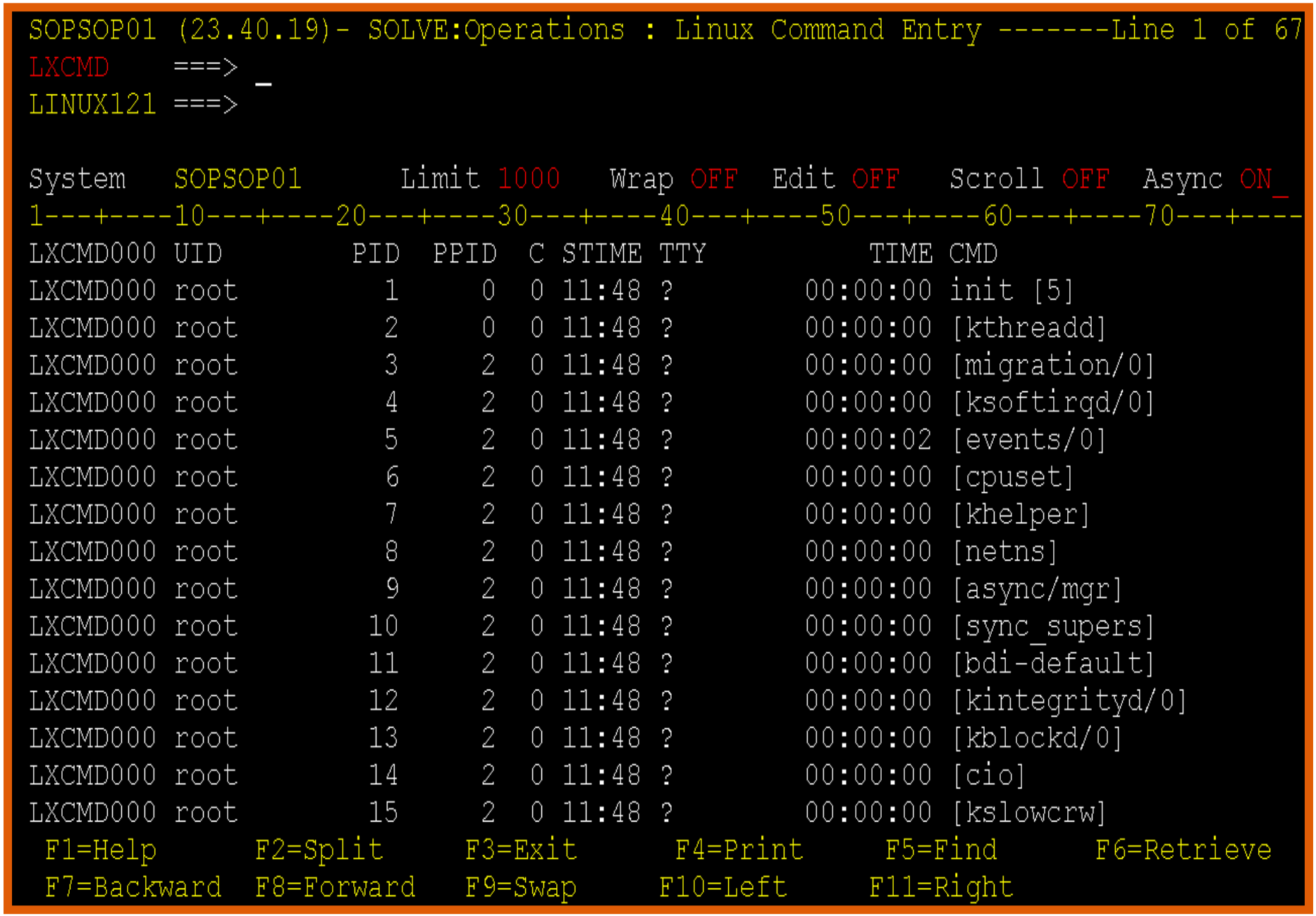
- Systems dynamically discovered

```
DENM9-------- Automation Services : System Image -
S/B=Browse U=Update C=Copy D=Delete R=Resources STL=Set TLog Size
    System                                                  Home
    Name       Vers.  Short Description                    System
    ZVMT001    0001   Dynamically discovered               CA11
    ZVMT002    0001   Dynamically discovered               CA11
    ZVMT003    0001   Dynamically discovered               CA11
    ZVM0001    0001   Dynamically discovered               CA11
    ZVM0002    0001   Dynamically discovered               CA11
```

Linux on System z Resources in CA SOLVE:Operations Guests and Applications







Summary

Linux systems are increasingly being moved to System z

CA Mainframe Connector for Linux on System z can automatically "connect“ Linux and z/VM systems to z/OS based automation

Through new interfaces, CA SOLVE:Operations and CA OPS/MVS on z/OS allow you to manage the environment holistically

CA Technologies has created a robust simulator to stress test

Interested in Seeing More?

Visit the CA Linux Management for Mainframe web portal at:

http://www.ca.com/us/mainframe-linux.aspx

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