IBM zPDT System z Personal Development Tool
Advanced Topics and Demo

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Agenda

Part I:

- The technology that is the IBM System z® Personal Development Tool (zPDT)
  - What is it all about?
  - How does it work?
  - What offerings are available in the market?

Part II:

- Some advanced topics about the IBM System z® Personal Development Tool (zPDT)
  - Features & Functions
  - Hints & Tips
  - Live Demo

The IBM System z Personal Development Tool (zPDT)

An overview

- **The zPDT technology consists of hardware and software**
  - **zPDT software enables System z architecture**
    - Runs on a Linux for x86 environment
  - **zPDT hardware (1090-L01, -L02, -L03, USB hardware key) is a security key that authenticates the zPDT software**
    - Plugs into the USB port (looks like a 'memory stick')
    - The key expires annually and must be re-certified annually
    - The zPDT software will not run without the 1090 USB key installed
    - The 1090 can enable an environment with 1, 2, or 3 virtual engines

- **A working zPDT-based application development system consists of many pieces:**
  - Thinkpad or System x (or equivalent) ... and ...
  - 64-bit Red Hat or SUSE Linux on the Thinkpad or System x ... and …
  - zPDT hardware (1090 – in USB port) ... and …
  - zPDT software ... and …
  - System z operating system(s) / middleware / tools

zPDT can support many System z functions

Development OS	64-bit System z operation z/OS®, z/VM®, z/VSE™, Linux for System z Uni- and multi-processor configurations (1-way, 2-way, or 3-way)
Disk	Simulated disk: CKD and FBA Device Sharing, CKD Versioning 9336 FBA, any model, > 2G 3380 / 3390 CKD, any model to 64K cylinders 3390 Extended Address Volume (EAV)
Tape	Attached tape: IBM TS1120, IBM 3580 Ultrium, Fujitsu M2488E Simulated tape: 3420, 3422, 3480, 3490, 3590 Data Compression
Other	Simulated: 1403 and 3211 Printers, 2540 Card reader, 3422 OMA (CD-ROM in TDF Format), 327x extended data stream display device, 3215 hardcopy console device 4764 Crypto PCI Express2 and 3088 CTC (with zPDT V1.2)* Coupling Facility (with zPDT V1.2.1)**
Capacity	zPDT hardware, 1090, up to 3 virtual engines Engines can be defined as CP, zIIP, zAAP, and IFL (no ICF) Not more than ONE operating system instance per virtual engine Can use z/VM virtualization to support more OS images, where T&Cs allow

§ **Note:** zPDT technology does not produce an environment equal to a larger System z.

* Support for this function was added with zPDT V1.2 (June 30, 2010)
** Support for this function was added with zPDT V1.2.1 (Dec 15, 2010)

zPDT technology tested on hardware and software

The zPDT technology has been tested with the following configurations:

64-bit Intel Linux tested:					
- openSUSE levels tested :	10.3	11.1	11.2		
- RHEL levels tested :	5.2	5.3	5.4		
Intel-based Hardware Systems tested					
- Laptops :	Lenovo T61P	Lenovo W500 Dual Core	Lenovo W700 Dual Core	Lenovo W700 Quad Core	
- Servers:	IBM System X 3850	IBM System x 3500 M1	IBM System x 3650 M1	IBM System x 3500 M2	IBM System x 3650 M2
- Additional minimum requirements:					
Cores:	One (or more) more core than number of zPDT virtual engines				
Memory:	1 GB for 64 bit Linux and 2 GB (or more) for the System z OSes				
Disk space	z/OS ADCD – 80 GB,	z/VM – 20 GB,	z/VSE – 10 GB,	Linux for System z – 10 GB	
SCSI Tape Drives tested:	Fujitsu M2488E	IBM 3580 (LTO)	IBM 3592E05		
z/OS Levels tested:	1.9	1.10	1.11		
z/VM Levels tested :	5.3	5.4	6.1		
z/VSE Levels tested :	4.1	4.2	4.3		
Linux on System z lvls tested :	SLES 10	SLES 11	RHEL 5.2	RHEL 5.4	

Intel hardware

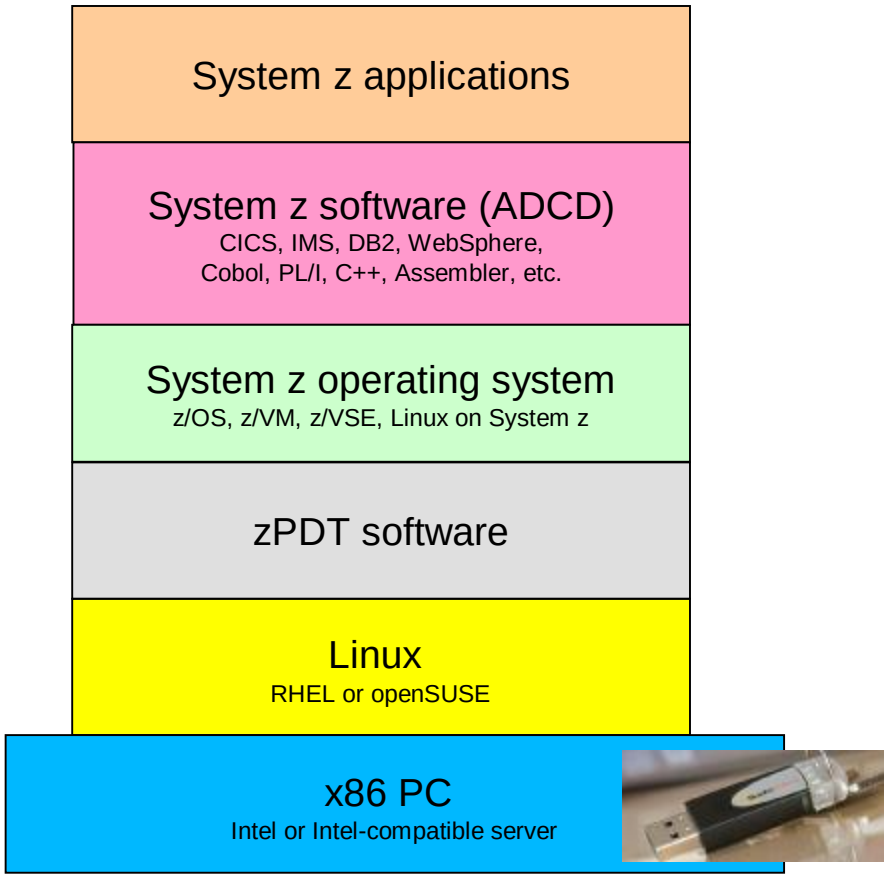
- **IBM has tested a variety of hardware systems**
  - Others may work, but IBM cannot test everything
- **Laptops**
  - W500, W700, T61 … also T60, home-built, HP, Dell, etc.
- **Servers**
  - IBM System x 3650 M1/M2, IBM System x 3500 M1/M2
- **Strongly recommend: # cores > # CPs**
- **Memory: more is better!**
  - 3 GB practical minimum, up to 90 GB tested
  - Strongly recommend: PC memory >= System z memory + 0.5 GB
- **Disk space**
  - Linux + 2.8 GB for each 3390-3 + awstape space
- **CD/DVD drive needed**
  - USB port needed for the 1090 token
- **One Ethernet port usually sufficient**
  - Shared by Linux and zPDT
  - A TCP/IP tunnel used for Linux / zPDT communication

Linux versions

- **Red Hat 64-bit**
  - Primarily RHEL 5.3
- **openSUSE 64-bit**
  - openSUSE 10.3
  - openSUSE 11.0
  - openSUSE 11.1
- **Also SLES and Fedora**
  - Not extensively used, yet
- **Requires 64-bit Intel hardware and 64-bit Linux**
  - Other versions for IBM internal use
- **RHEL vs openSUSE**
  - Different library levels for compile/run
  - No functional differences
- **You must provide the base Linux distribution**

Packaging

- **At basic level, three components for complete system**
  - IBM 1090 token
  - IBM zPDT software (5799-ADE)
  - IBM System z software (operating system, middleware, etc.)
- **System z software is not part of zPDT**
  - May be packaged together in a “higher level” package
  - Typically this means the ADCD system (Application Development Controlled Distribution) in zPDT format for z/OS, z/VM, or z/VSE



Support

- **zPDT license says “unwarranted software”**
  - In practice, quick response to zPDT problems
  - However, zPDT support is only for the zPDT product, i.e. the IBM 1090 token and the zPDT software itself
- **z/OS problems, z/VM problems, z/VSE problems, System z software problems, middleware problems, and/or “how to” questions are different issues**
  - Support depends on “higher level“ packaged offerings and on sales channel
- **zPDT Forum: http://groups.yahoo.com/group/z1090**
  - Forum is for *informal* discussions by zPDT users
  - Open to discussions about ADCD, etc, etc.
  - IBMers *may* also participate informally in forum
  - Must register for YAHOO userid to use it

Installation overview

- **Install base Linux and verify operation**
  - May need to find x3270 terminal emulator
- **Execute the 1090 “installer program”**
  - This installs two prerequisite RPMs and zPDT
- **Edit several Linux control files**
- **Activate zPDT token via IBM ResourceLink**
  - Good for 12 months
- **Copy ADCD volumes from DVDs**
  - gzip format
  - Trivial to install
- **Build “device map”** (see example on next page)
  - Simple flat Linux file, to define the System z setup + emulated devices
- **Start zPDT, x3270, IPL System z operating system**
- **Typically takes a few hours to install**
  - Requires basic Linux skills
- ***Read the IBM Redbooks first!!***
- **LAN & OSA setup requires reading and understanding**
- **Keep your first installation as simple as possible**

devmap – z/OS example

```
[system]
memory 2000m
3270port 3270
processors 1

[manager]
name awsckd 0001
device 0A80 3390 3990 /z/SBRES1
device 0A81 3390 3990 /z/SBRES2

[manager]
name aws3274 0200
device 0700 3279 3274 mstcon
device 0701 3279 3274
```

devmap – z/VSE example

```
[system]
memory 1536
subchannels 56
mode esa
cpuid 00007701
gmtoffset +6
netname sys1
3270PORT 3277

[manager]
name aws3274 1
device 0009 3279 3274

[manager]
name awsrdr 2
device 000C 2540 2821 ./*.rdr /nt

[manager]
name awsprt 3
device 000E 1403 2821 ./printer.lst

[manager]
name awsosa 10 --path=f0 --pathtype=osd
device 120 osa osa --unitadd=0
device 121 osa osa --unitadd=1
device 122 osa osa --unitadd=2
device 12f osa osad --unitadd=fe

[manager]
name aws3274 5
device 0060 3279 3274 usr060
device 0061 3279 3274 usr061

[manager]
name awstape 8
device 0180 3480 3803 /home/ibmsys/zPDT/tapes/tape1.aws
device 0181 3480 3803 /home/ibmsys/zPDT/tapes/tape2.aws

[manager]
name awsckd 4
device 0300 3390 3990 /home/ibmsys/zPDT/System/dosres.ckd
device 0301 3390 3990 /home/ibmsys/zPDT/System/syswk1.ckd
device 0302 3390 3990 /home/ibmsys/zPDT/System/syswk2.ckd
```

Multiple instances

- **IBM 1090-L01, -L02, -L03 --- denotes number of CPs**
  - zPDT price tied to model number (number of CPs)
  - Not directly related to number of PC “cores” available
- **CPs may be used in one or several instances**
  - Maximum 3 CPs
- **zIIP, zAAP, IFL can replace a CP**
  - Limit of 3 remains
- **Multiple instances can share DASD, tape pool, OSA, local 3270s**
- **z/VM may be a better alternative in some cases**
  - More z/OS instances, zAAPs, zIIPs without exceeding CP limit
- **Strongly suggest single instance (may be with multiple CPs) for *initial* usage**

Skills needed

- **Basic Linux skills needed for underlying PC**
- ***Read the IBM Redbooks before asking for help!***
  - SG24-7721 Introduction and Reference
  - SG24-7722 Installation and Basic Use
  - SG24-7723 Additional Topics
- **System is as simple as we could make it, but ……**
- **z/OS skills needed in order to manage your own z/OS system**
  - *You* are the operator, systems programmer, network administrator, database administrator, user, …
- **OSA, TCP/IP, and Ethernet skills needed to set up network**
  - This is usually the greatest problem area
  - Read the red books!
- ***Use the forum!***

Some additional discussion points

- **Availability, ordering, prices, T&Cs**
  - Was discussed in previous session
- **How many users?**
  - TSO, CMS, HTTP, WebSphere, …
- **MIPS? MSUs? LSPR numbers?**
- **Move token between PCs?**
  - TOD issues
- **Virtual CP linked to one Intel processor?**
  - 1:1 relation?
- **USB disk drives? Flash memory sticks? USB extenders?**
- **VMWare or Xen?**
  - Dual boot?
- **All the z10 instructions? What about z196 instructions?**
- **Backlevel operating systems?**
  - z/OS 1.3?, VSE/ESA 2.3?

Press on zPDT

- Robert Crawford at SearchDataCenter.com (July 2010)
  http://searchdatacenter.techtarget.com/tip/IBMs-zPDT-offers-developers-z-OS-on-the-desktop

- Mike Hammock at OpenMainframe.org (March 2010)
  http://openmainframe.org/featured-articles/what-is-this-zpdt.html

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IBM's zPDT offers developers z/OS on the desktop

By Robert Crawford, Contributor
SearchDataCenter.com

Digg This Stumble Delicious

After suggesting in a recent column that IBM should offer a "mini mainframe" that makes z/OS available on x86, I discovered that the company had introduced Rational Developer for System z (RDz) 7.6.2, which includes a unit test feature. Rational Developer for System z's unit test provides a z/OS environment on developers' desktops, including most of the major subsystems. Lo and behold, underlying the RDz unit test is System z Personal Development Tool (zPDT).

Requirements and configuration of zPDT

System z Personal Development Tool, which is able to emulate Z operating systems and software, runs on an Intel processor and Linux system. According to the zPDT Redbook, it will run on 32-bit or 64-bit distributions of openSUSE and Red Hat Enterprise Linux (RHEL) 5.3 or later. However, IBM recommends the 64-bit distributions for performance and support reasons.

March 19, 2010

What is this "zPDT"?

(Hammock IT Services) By C. M. (Mike) Hammock

The latest entrant into the IBM mainframe compatible world is really anything but "open", but followers of the mainframe world, open or not, should be interested. Although IBM's "System z Personal Development Tool" (zPDT) is the newest package to enter the world of "software-based systems" (as IBM puts it) or emulation (as most others refer to it), it actually has a long history in this field.

Click to read more...

Summary: zPDT technology

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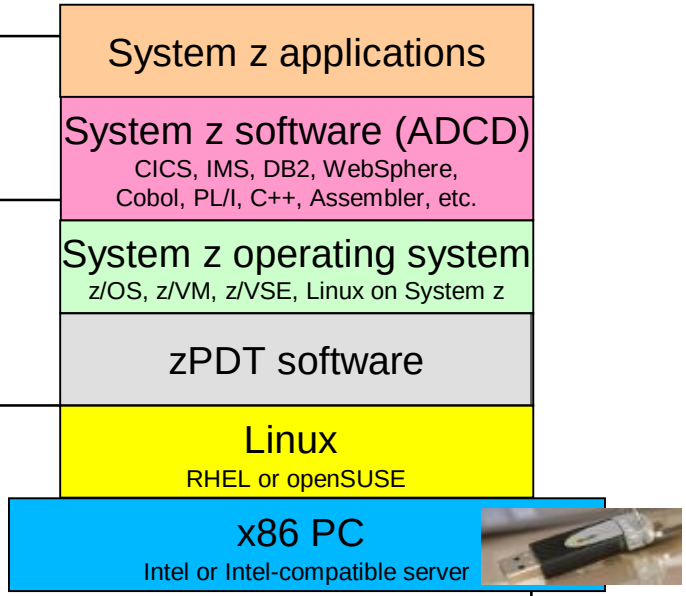

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More information

§ zPDT home (IBM PartnerWorld membership required)

- http://www.**ibm.com**/partnerworld/pwhome.nsf/weblook/pat_sas_zpdt.html
- Information on: IBM System z Developer Discount program, zPDT features and functions, zPDT system requirements, zPDT support options, zPDT how to order

§ ITC uPDT

- http://www.p390.com/pdf/uPDTOverview.pdf

§ Forum for zPDT users

- http://groups.yahoo.com/group/z1090

§ Forum for Rational Developer for System z Unit Test users

- http://www-949.ibm.com/software/rational/cafe/community/cobol/rdzut

§ Additional zPDT documentation

- The following are available at http://www.redbooks.**ibm.com**
  - System z Personal Development Tool Volume 1: Introduction and Reference SG24-7721
  - System z Personal Development Tool Volume 2: Installation and Basic Use SG24-7722
  - System z Personal Development Tool Volume 3: Additional Topics SG24-7723
- The following are available in the Resource Link Library: www.**ibm.com**/servers/resourcelink
  - System z Personal Development Tool 1090 User's Guide G229-1101
  - System z Personal Development Tool Statement of Limited Warranty SC27-2604

Thank You