zPDT and RD&T
Application Development for z on x

zAI26

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Agenda

§ **IBM System z® Personal Development Tool (zPDT)**

– **Technology**

– **Features & Functions**

– **Recent Enhancements**

§ **IBM Rational Development and Test Environment (RD&T)**

– **Application Development for System z on System x**

§ **Select Topics on comparing zPDT vs RD&T**

– **Software Stack**

– **Support**

– **Pricing**

The IBM System z Personal Development Tool (zPDT)
Look at application development for IBM System z in a new way

§ **The IBM System z Personal Development Tool (zPDT) is the technology behind several new application development tools from IBM.**

§ **The zPDT technology can enable a virtual System z architecture environment that allows certain mainframe operating systems, middleware and software to run unaltered on Intel® and Intel-compatible platforms**

– Such as, Lenovo Thinkpad® W Series or IBM System x® 3500 or 3650 server, or systems otherwise approved by IBM

§ **Develop applications for System z without the System z hardware.**

The IBM System z Personal Development Tool (zPDT)
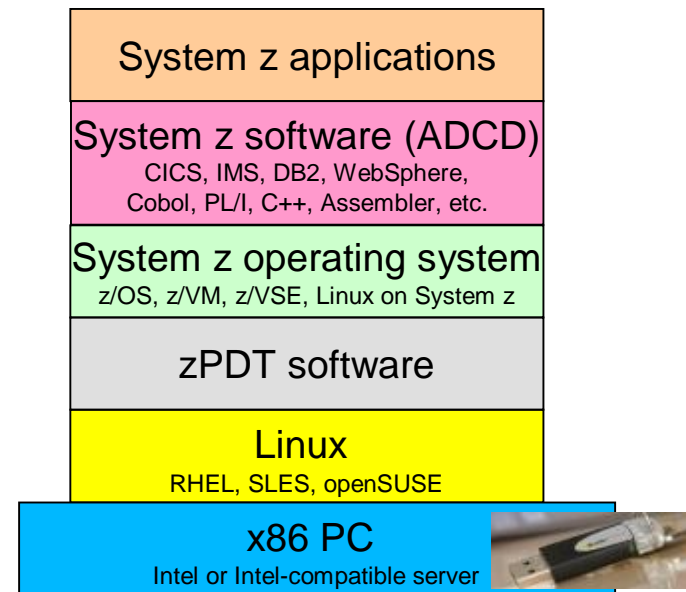*Externally available since October 30, 2009*

§ **The zPDT technology consists of hardware and software**

 – **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

 – **zPDT software enables System z architecture**

   • Runs on a Linux for x86_64 environment

§ **A zPDT-based system consists of many pieces:**

   • Thinkpad or System x (or equivalent)
   • 64-bit Red Hat or SUSE Linux on the Thinkpad or System x
   • zPDT hardware (1090 – in USB port)
   • zPDT software
   • ADCD: System z operating system(s) / middleware / tools

System z applications
System z software (ADCD) CICS, IMS, DB2, WebSphere, Cobol, PL/I, C++, Assembler, etc.
System z operating system z/OS, z/VM, z/VSE, Linux on System z
zPDT software
Linux RHEL, SLES, openSUSE
x86 PC Intel or Intel-compatible server

zPDT functions (Page 1 of 3)

§ **System z operating system support:**

- Full 64-bit System z operation with both uniprocessor and multiprocessor configurations
- Support for z/OS®, z/VM®, z/VSE™, and Linux® for System z

§ **Up to 3 virtual CPUs (z196 compatible) enabled by the IBM 1090 USB key:**

- The zPDT comes in three system sizes: one, two, or three virtual engines. The size of the virtual system is defined by the model of the 1090 USB hardware key (product number 1090-L01, 1090-L02, or 1090-L03, where the model number corresponds to the number of virtual engines).
- Virtual engines can be configured as:
  - System z general purpose processors (CP)
  - System z Integrated Information Processor (zIIP)
  - System z Application Assist Processor (zAAP)
  - System z Integrated Facility for Linux (IFL)
- Not more than ONE operating system instance per virtual engine, for example:
  - zPDT with three virtual engines can be configured as:
    - A single instance with three engines
    - Three instances with a single engine each
    - Two instances, one with two engines and the other with one engine
  - The z/VM operating system can be used to virtualize these configurations even further and create any number of engines and engine types within an instance (where terms & conditions allow).

zPDT functions (Page 2 of 3)

§ **Memory:**

- Greater than 2 GB of System z memory

§ **Networking:**

- Simulated OSA-Express2 adapter, in either QDIO or non-QDIO. This functionality is provided using ordinary Ethernet adapters on the x86 host machine.

§ **Disk devices:**

- Simulated ECKD disk
  - 3390 disk volumes, including variable sizes, and large EAV (Extended Address Volume) volumes
  - 3380 disk volumes
  - A CKD versioning function that allows a 3390 (or 3380) volume to be quickly restored to a specified point in time.
- Simulated FBA disk (as used by z/VM and z/VSE)
  - 9336, any model, > 2 GB
- Sharing of simulated ECKD and FBA across operating system instances

zPDT functions (Page 3 of 3)

§ **Tape devices:**
- Simulated 3420, 3422, 3480, 3490, 3490E, and 3590 devices
- Selected SCSI-attached tape drives may be used directly by zPDT or via Linux staging functions. SCSI tape drives tested by IBM include:
  - IBM 3580 Ultrium (LTO)
  - IBM 3592 E05.
  - IBM TS1120
  - Fujitsu M2488E
- Data Compression can be manually enabled for simulated tape devices or manually enabled for SCSI tape drives if the drive hardware supports compression
- 3422 OMA simulated tape device can read TDF format

§ **Other System z devices (simulated):**
- Card reader (2540) with functions to process both EBCDIC and ASCII data
- 1403-N1 or 3211 printer, including FCB emulation for 3211 functions
- Local 3270 (via an emulated 3274) connections. Extended data stream is supported if the 3270 client supports it.
- 3270 terminals
- 3215 console, including several System z console interface functions
- A 1090 device manager that allows Linux commands to be issued to the underlying Linux operating system from the System z operating system.

Updates with zPDT V1.2
Available since June 11, 2010

§ **Emulated IBM System z Crypto Express2 (IBM 4764 PCI-X Crypto Coprocessor)**
  – Perform AES, DES, TDES, RSA, and SHA-1 cryptographic processes
  – Note 1 – No physical security as the function is emulated with no HW component.
  – Note 2 – The accelerator function of a crypto adapter is not available.

§ **Emulated IBM 3088 CTC device**

§ **z/OS Data migration utility**
  – Allows easy migration of 3380 and 3390 volumes to the zPDT-based system
    • Clone a 'big z/OS system' to the zPDT-based system
  – Consists of a client / server application
    • Linux client program "hckd2ckd" loaded on any supported Linux system
    • z/OS server program "zosserv" loaded on z/OS system and given authorization to access full volumes
  – Operation
    • Once the z/OS server program is installed and running, the Linux client can perform full volume copies of any 3380 or 3390 volume the server can access. Ensure the system is stable, with z/OS not writing to the disk.
    • After successful transfer, the output file is a valid zPDT CKD volume ready for use.

Updates with zPDT V1.2.1
Available since Dec 15, 2010

§ **Emulated Coupling Facility** - write applications that leverage Parallel Sysplex
  – z/OS Coupling Facility function is only available under z/VM
    • Each CF and z/OS is a z/VM guest
  – No support for physical or emulated coupling links
    • Multiple zPDT systems cannot be clustered
  – Coupling Facility "startup" configuration (z/OS V1.13 as a guest of z/VM) available on request, additional T&Cs apply
    • The corresponding redbook discusses z/OS 1.11, however the differences are very minor

§ **z/VM Data migration utility**
  – Allows easy migration of 3380, 3390, and FBA volumes to the zPDT-based system
    • Clone a 'big z/VM system' to the zPDT-based system
  – Consists of a client / server application
    • Linux client program "hckd2ckd" loaded on any supported Linux system
    • Server program "zvmserv" loaded on z/VM system and given authorization to access full volumes
  – Operation
    • Once the z/VM server program is installed and running, the Linux client can perform full volume copies of any 3380, 3390 or FBA volume the server can access. Ensure the system is stable, with z/VM not writing to the disk.
    • After successful transfer, the output file is a valid zPDT CKD or FBA volume ready for use.

Updates with zPDT V1.2.2
Available since June 30, 2011

§ **CP Assist for Cryptographic Function (CPAF)**
- Message Security Assist 3
  - Protected Key Support
- Message Security Assist 4
  - New functions for additional chaining options (CFB, OFB counter modes)
  - New functions for XTS-AES

§ **Unique Identifier Management Daemon (UIMD)**
- New services to manage unique identifiers within zPDT
  - CPU Serial Number
  - LPAR Number
- Maintains consistent serial numbers per zPDT instance

§ **New Utilities**
- PDSUTIL
  - Allows editing of emulated ECKD PDS members (e.g. z/OS files) from x86_64 Linux
- LISTVTOC
  - Provides VTOC listing of z/OS emulated ECKD file from x86_64 Linux

Updates with zPDT V1.3
Available since March 30, 2012

§ **z196 Architecture**

- Increased scalability
- Improved code efficiency and improved execution of CPU-intensive workloads
- Improved RAS

§ **z196 Crypto – Crypto Express3 compatible (CEX3C)**

- AES, DES and T-DES based confidentiality and message integrity
- RSA-based and ECC-based digital signature generation and verification and message hashing
- Supported Key Management Algorithms

§ **Coupling (D93G R17 SL 4.8)**

§ **Performance**

- Instruction execution
- Improved shared emulated ECKD locking

zPDT limitations

§ **The zPDT environment does NOT support all System z function, such as:**

- Physical Parallel, ESCON®, FCP, FICON® and High Performance FICON channels
- Physical Coupling Links
- External Time Reference (ETR)
- Server Time Protocol (STP)
- IBM zEnterprise System function, e.g.
  - Inbound Workload Queuing
  - z/OS FICON Discover
  - Auto Configuration

- List-directed IPL
- MIDAWs
- Logical channel subsystems
- HiperSockets™
- Multiple I/O paths per device
- Not all CHSC functions are supported

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

- Some aspects of a larger system are unlikely to be met in any very small environment.
  - Inability to verify and enhance the scalability of a program
  - Inability to run application programs that require hundreds of MIPS.
- A zPDT system is not recommended for very fine-level performance tuning that is sensitive to memory location, cache functions, and pipeline optimization.
- In addition, the zPDT platform does not nearly have the same quality of service as does a mainframe in terms of availability and connectivity.

§ **Anyone needing any of the function outlined above should consider a traditional System z server.**

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 :	11.0	11.1	11.2	11.3	11.4
- SLES levels tested :	11 SP1				
- RHEL levels tested :	6.0	6.1	6.2		

Intel-based Hardware Systems tested				
- Laptops :	Lenovo T61P	Lenovo W500 Dual Core	Lenovo W700 Dual Core	Lenovo W700, W510, W520 Quad Core
- Servers:	IBM System X 3850	IBM System x 3500 M1, M2, M3	IBM System x 3650 M1, M2, M3	IBM System x 3755 M1, M3
- <u>Additional minimum requirements</u> :				
x86 Cores :	One (or more) more core than number of zPDT virtual engines			
Memory :	1 GB for 64-bit Linux plus 2 GB for the System z OSes (ie. minimum of 3 GB)			
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:	1.11	1.12	1.13

z/VM Levels tested :	5.3	5.4	6.1

z/VSE Levels tested :	4.2	4.3	5.1

Linux on System z Levels tested :	SLES 10	SLES 11 SP1	RHEL 5.2	RHEL 5.4

§ **If you choose to build your own zPDT system, test your hardware first!**

– Validate hardware configuration is meeting minimum system requirements (tool provided)

– Test hardware and Linux distribution to ensure appropriate drivers and functions work (Ethernet, wireless, USB, etc)

zPDT documentation

SG24-7721

IBM System z
Personal Development Tool
Volume 1 Introduction and Reference

SG24-7722

IBM System z
Personal Development Tool
Volume 2 Installation and Basic Use

SG24-7723

IBM System z
Personal Development Tool
Volume 3 Additional Topics

SG24-7859

IBM System z
Personal Development Tool
Volume 4 Coupling and Parallel Sysplex

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

Data Center Tips:

TIPS & NEWSLETTERS TOPICS | SUBMIT A TIP

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...

zPDT technology is available to ...

§ **IBMers** - to provide education and demonstration of IBM products and services.
  – Go to BluePedia, look up zPDT on how to order, and build your own system

§ **Independent Software Vendors (ISVs)** who develop, test, support, and demonstrate commercially available applications on and for the z/OS, z/VM, z/VSE, and Linux for System z platforms.
  – zPDT as part of IBM System z Developer Discount (zDD) Program
  – Full application development lifecycle

The following two slides are on zPDT for ISVs

§ **Commercial Customers** incl. service providers, system integrators, contractors, business partners, ISVs, … anybody who currently develop or plan to develop applications or services for z/OS.
  – zPDT as part of Rational Development and Test Environment for System z (RD&T), formerly called Rational Development for System z Unit Test feature (RDz UT)
  – Pre-production z/OS environments only

§ **Academic Initiative for System z** – Professors, teachers, academic employees, etc.
  – For hands-on classes, demonstrations, education & training, research, application development, etc. – not for production use
  – Pilot program with select schools successfully completed
  – Academic Initiative offering currently being finalized

ISVs - How can you get zPDT technology?

Independent Software Vendors (ISVs) are eligible to get zPDT technology if they
- develop,
- test,
- support, and/or
- demonstrate

commercially available applications on and for the
- z/OS,
- z/VM,
- z/VSE, or
- Linux for System z

platforms.

§ zPDT technology for ISVs requires the ISV to be
- Member of IBM PartnerWorld, and
- Approved for the IBM System z Developer Discount (zDD) Program.

§ ISVs can obtain zPDT technology worldwide as
- Build your own - Order zPDT technology from ITC (Information Technology Company, LLC)
- A complete solution – Order uPDT from ITC (or from qualified ITC Business Partner)

ISVs – Get a complete working system: uPDT

§ **The Ultimate Personal Development Tool (a zPDT-based system) is available worldwide through Information Technology Company, LLC (ITC)**

- www.p390.com
- Vendor with over 30 years of experience with mainframe hardware, software, and services
- Headquartered in Falls Church, Virginia
- Branch offices around the world

Benefits:

§ Get started quickly, the uPDT comes fully built and configured
- Tested x86_64-bit hardware
- Loaded with (Intel) Linux, zPDT SW, and ADCD SW stack(s)
- zPDT product support
- Education, installation, customization, networking, and data management
- Additional services available on request.

§ Flexible zPDT licensing
- Available as 1-, 2-, and 3-way configurations, capable of supporting many images
- Run z/OS, z/VM, z/VSE, and Linux for System z environments (ADCD)
- Order additional IBM software
- Unlimited number of users
- Used for ISV product development, demonstration, education, and support
- Available worldwide

Worldwide	Information Technology Co. LLC PO BOX 688 Falls Church, VA 22040 www.p390.com	John Cotte +1-800-994-9441 +1-703-237-7370 sales@p390.com

zPDT and RD&T

zPDT technology is available to ...

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   – Go to BluePedia, look up zPDT on how to order, and build your own system

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   – Full application development lifecycle

The following slides will discuss RD&T for z/OS

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The original System z development environment for z/OS
ISPF has provided consistent tooling for decades ... but it is limiting


Challenges:

- Constant connection to mainframe is required
- Development shares processor with production use, gets lower priority
- Inability to create cross platform components
- ISPF green screen UI is unappealing to and can be difficult for new hires to learn
- MIPS usage for development vs. production usage

Rational Developer for System z (RDz)

Eclipse-based tools to develop and maintain enterprise applications spanning multiple platforms and languages
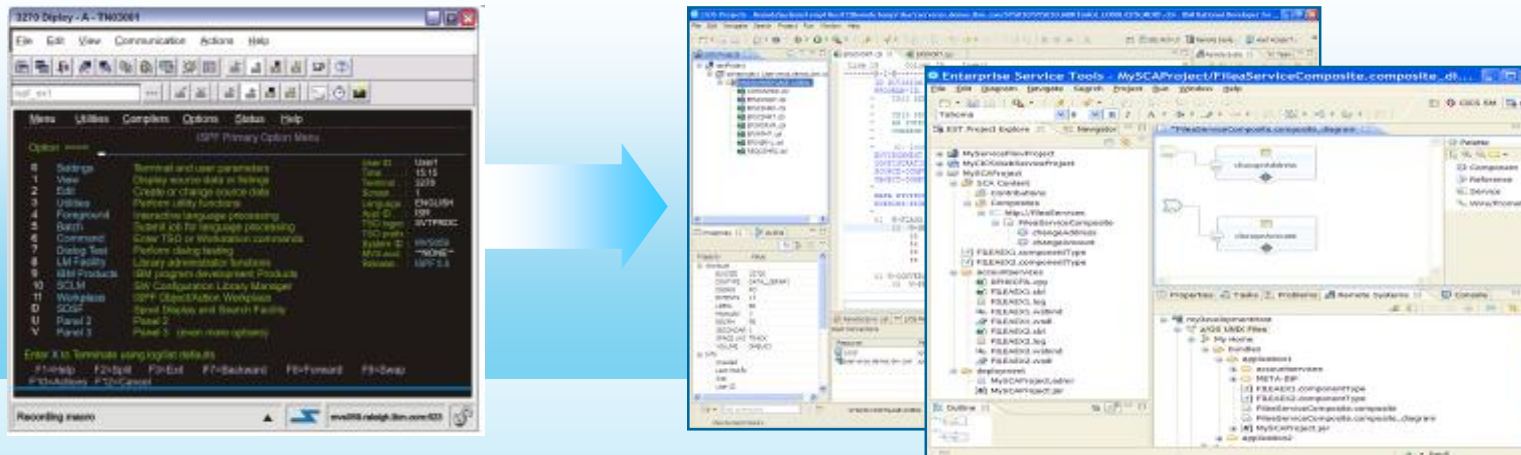
ü 50%-80%[1] reduction in host CPU usage
with workstation syntax checking

ü 15% or more improvement in developer productivity[1]

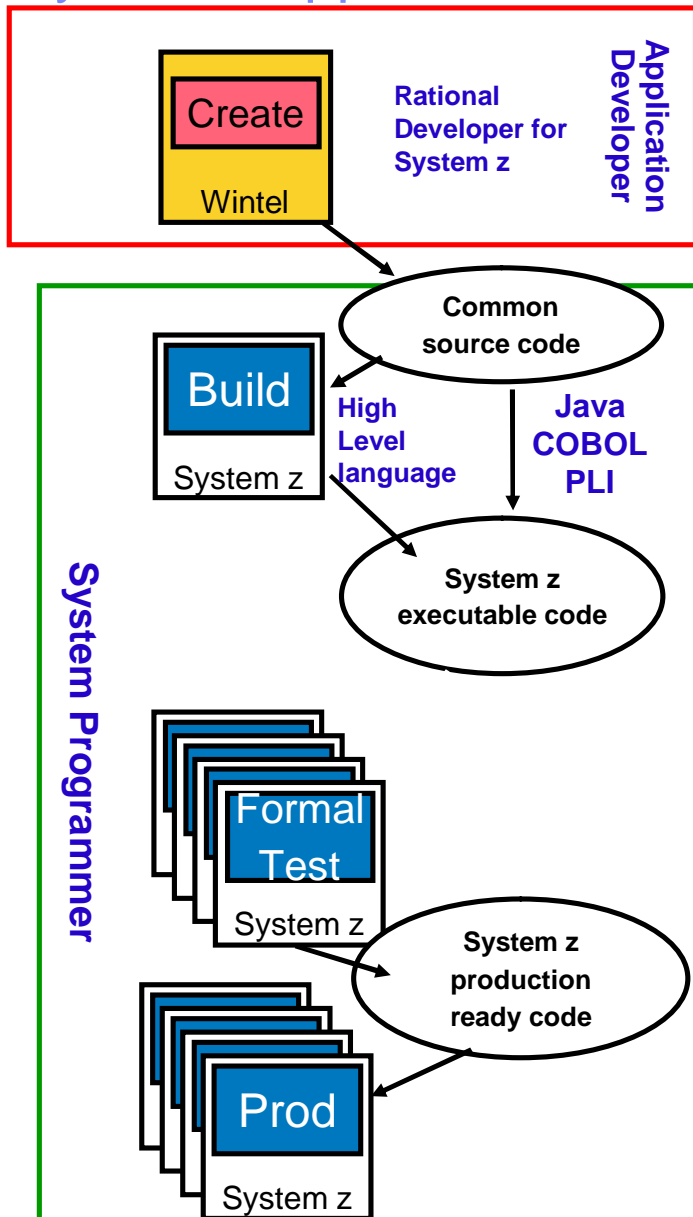ü Tools with which to attract new talent

§ Rational Developer for System z

"RDz offers a uniform, open programming environment for both J2EE and PL/I developers. RDz accelerates PL/I development with its local syntax checker and debugging tool."
- Dr. Axel Lömker, KfW Bankengruppe

[1] Aggregation of results from a productivity study conducted by IBM System z customers

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Today's RDz application development cycle

Application Developer

Create

Wintel

Rational Developer for System z

System Programmer

Common source code

Build

System z

High Level language

Java COBOL PLI

System z executable code

Formal Test

System z

System z production ready code

Prod

System z

Using tooling like RDz definitely has benefits and still some challenges, especially with testing….

§ System programming challenges
  - Gap between the developers and IT operations staff
    § Lack of available system programming skills or delays in getting requests completed
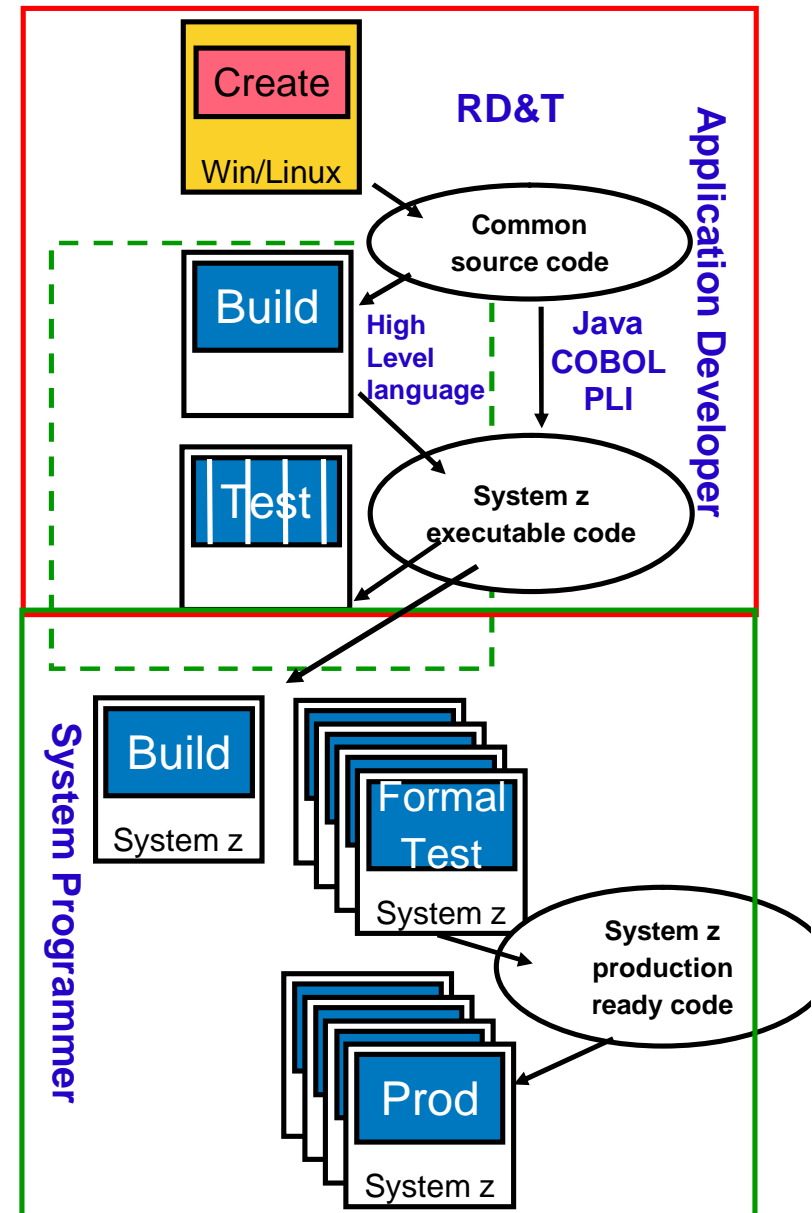
§ Cross platform application development
  - Developers don't have control of non-Intel systems
    § The ability to easily configure and deploy an application to the target runtime for testing can be a very time-consuming task.

§ The mainframe development environment is perceived as being more expensive on System z than on other platforms
  § Actually, there is no differentiation of MIPS costs between development MIPS vs test MIPS vs production MIPS.
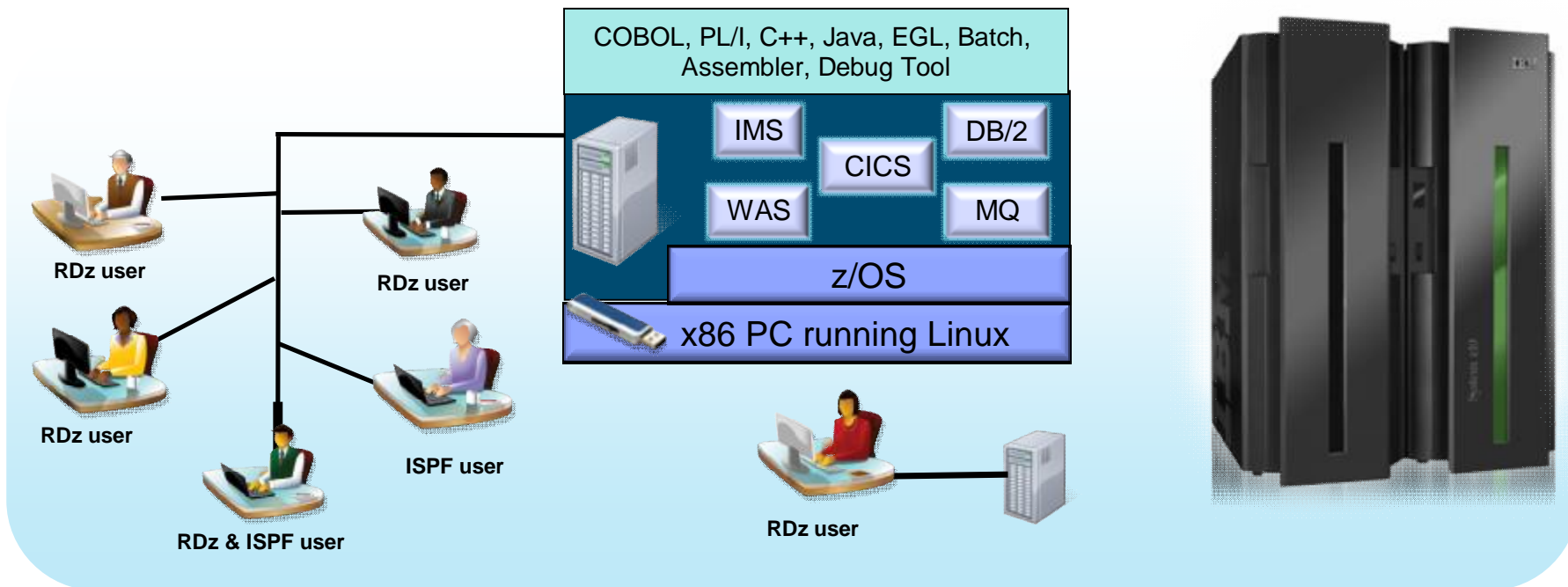
Introducing the Rational Development and Test Environment (RD&T)

§ Provides a local test environment for unit testing System z applications

- Unit test processing on Linux versus mainframe

§ Can enable companies obtain lower cost for development and unit testing

- Gives flexibility to developers / teams to accomplish unit tests on the mainframe or off

- Provides a local System z development / unit test environment to simplify development investments

- Frees up more mainframe capacity to production workload usage

§ Strengthens development processes through using actual compilers and runtimes in RD&T

- Use compilers for "true" syntax check/compile using Enterprise COBOL / PLI

- Use co-processors for CICS / DB2 / Custom to cut down on re-implementation efforts on local platform

§ Provides flexibility for system programming staff and development

- System programmers can define common test images for development teams for some centralization of control, but still provide developers with ability to make changes

RD&T

Application Developer

Create
Win/Linux

Common source code

Build

High Level language

Java COBOL PLI

Test

System z executable code

System Programmer

Build
System z

Formal Test
System z

System z production ready code

Prod
System z

Rational Development & Test Environment for System z
System z environment for testing on x86 Linux systems

COBOL, PL/I, C++, Java, EGL, Batch, Assembler, Debug Tool

IMS   DB/2
CICS
WAS   MQ

z/OS

x86 PC running Linux

RDz user

RDz user

RDz user

ISPF user

RDz & ISPF user

RDz user

§ Liberate developers to rapidly prototype new applications.

§ Develop and test System z applications anywhere, anytime.

§ Free up mainframe development MIPS for production capacity.

§ Eliminate costly delays by reducing dependencies on operations staff.

Note: This Program is licensed only for development and test of applications that run on IBM z/OS. The Program may not be used to run production workloads of any kind, nor more robust development workloads including without limitation production module builds, pre-production testing, stress testing, or performance testing.

RD&T - Details

Rational. software

RDz user

RDz user

RD&T

RTCz Agents	RDz Agents

Software Stack
z/OS	COBOL
CICS	PL/I
IMS	C++
DB2/z	Assembler
WAS/z	Debug Tool

Dev + Test Environment
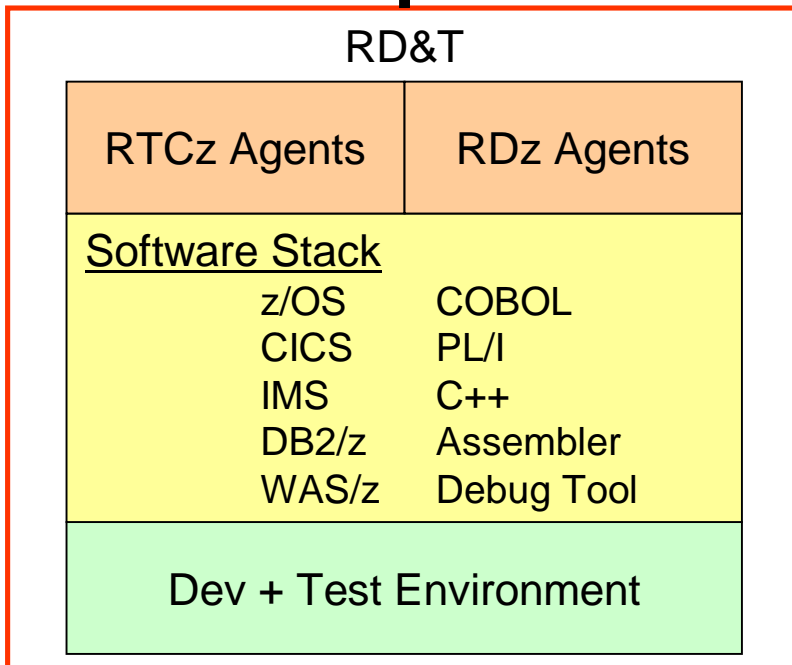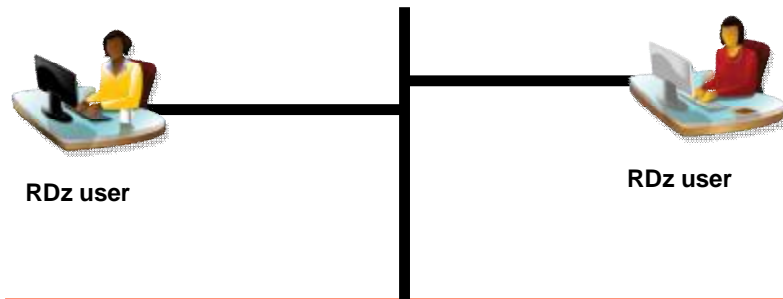
x86 PC/Server running Linux

<USB License Key 1091>

RD&T is made up of the following:

§ RD&T runs on an underlying Linux system based on an Intel processor.

 – Can provide a System z development platform on a PC and is capable of running current System z operating systems.

 – Note: RD&T is to be used only as a development system and may not be utilized for, nor is it designed as a production workload system.

 – Provides great flexibility to run a customized environment.

§ The included software stack provides an IBM middleware test environment

 – Actual middleware software (including z/OS)

 – Actual Enterprise compilers

 – No API simulation

§ RDz and RTCz agents

 – Packaged for simplification

 – Still need RTC client license to activate

RD&T - Hardware and software prerequisites

Rational. software

§ **Hardware requirements**

– Rational Development and Test Environment for System z requires the following minimum hardware:

- 64-bit Intel compatible processors with one core per allocated z/OS CP plus one core for native Linux. Up to 3 z/OS CPs and one native Linux are supported per instance of Rational Development and Test Environment for System z
- 2 - 4 GB of memory per z/OS CP, plus 1 GB for native Linux
- 50 - 120 GB of disk space for z/OS
- At least one Ethernet adapter is required for OSA operation
- RD&T USB hardware device (1091)

§ **Software requirements**

– Rational Development and Test Environment for System z requires the following minimum levels of Linux:

- SUSE Linux Enterprise Server 11 SP2
- openSUSE 11.2
- Red Hat Enterprise Linux 6.0 or 6.1

RD&T – Configurations

Rational. software

RD&T for System z offers the following configuration options:

§ **_Desktop Configuration_** enables a single virtual test engine environment.

- A single test engine environment is appropriate for small machines, such as a developer laptop.
- One engine will facilitate most types of traditional System z application testing such as Batch, CICS, IMS, DB2, COBOL, PL/I, and Assembler.

§ **_Server Configuration_** enables a three virtual test engine environment.

- A three test engine environment is appropriate for server machines supporting a team of developers or specialty workload.
- The three engines can be configured to test applicability of application code to zAAP or zIIP processors in addition to normal development and unit testing.
- Three engines will allow a wider range of testing options including all the options of the desktop configuration, but also facilitating testing of Java, WebSphere, and more data processing options in DB2.

RD&T – Licensing information

RD&T for System z offers the following licensing options:

§ **_Authorized User_** *is a unique person who is given access to the program.*

– An entitlement for an Authorized User (AU) is unique to that Authorized User and may not be shared, nor may it be reassigned other than for the permanent transfer of the Authorized User entitlement to another person.

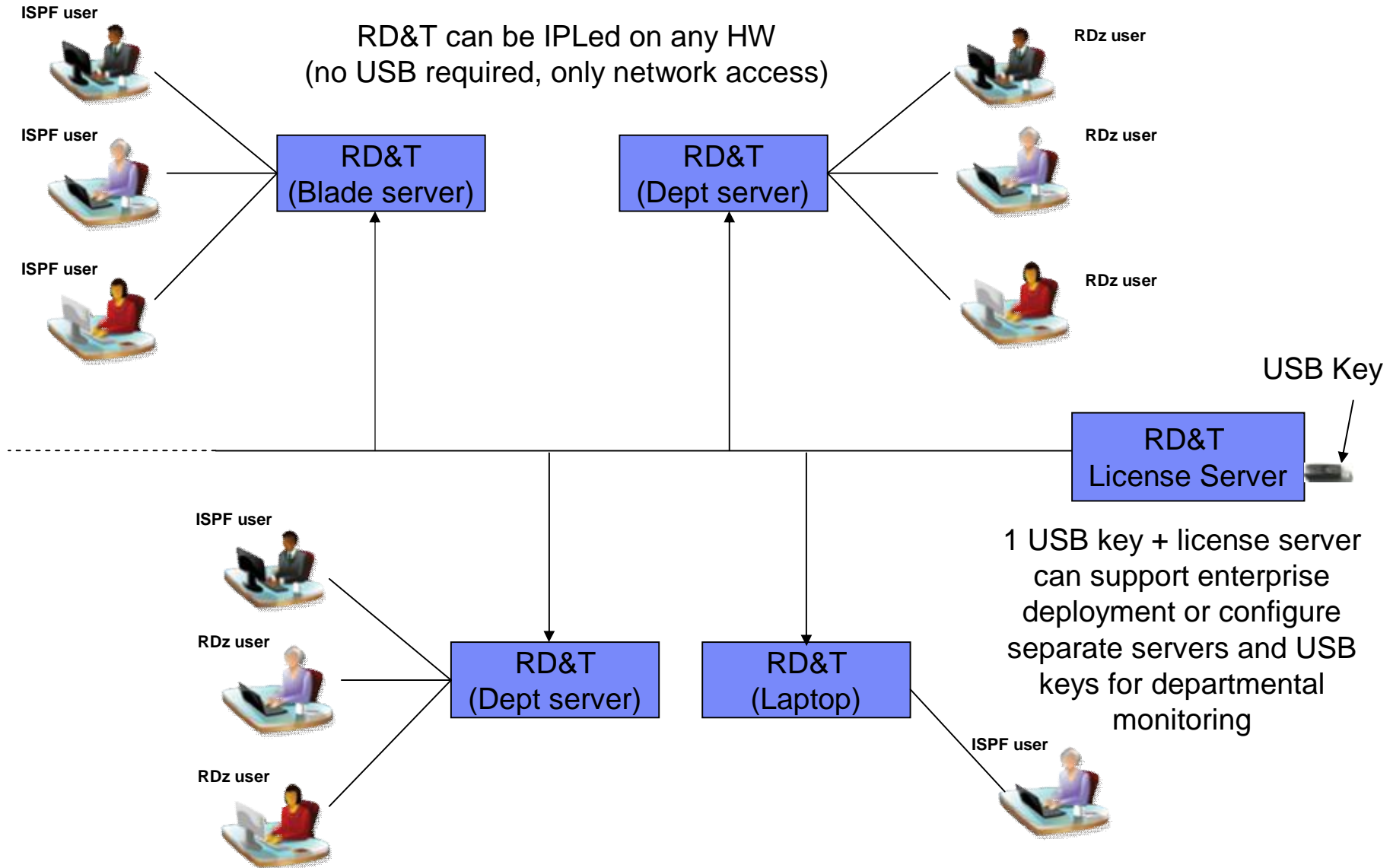§ **_Floating User_** *is a person who is accessing the program at any particular point in time.*

– Licensee must obtain separate entitlements for each Floating User simultaneously accessing the program.

Details are available at:
http://www-03.ibm.com/software/sla/sladb.nsf/displaylis/AF1CEB133368971885257A01005C9598?OpenDocument

Flexible configurations
Available since Nov 10, 2011

Rational. software

ISPF user

RD&T can be IPLed on any HW
(no USB required, only network access)

RDz user

ISPF user

RDz user

RD&T
(Blade server)

RD&T
(Dept server)

RDz user

ISPF user

RDz user

USB Key

RD&T
License Server

ISPF user

RD&T
(Dept server)

RD&T
(Laptop)

1 USB key + license server
can support enterprise
deployment or configure
separate servers and USB
keys for departmental
monitoring

RDz user

ISPF user

RDz user

Flexible configurations
Available since Nov 10, 2011

§ **RD&T License Server – Network-based, centralized license management system**

- – Available for RD&T server users
- – Easily IPL machines on hardware with limited/restricted USB access (e.g., System x Blades in a blade center)
- – No longer require USB token to be physically plugged into every zPDT machine
- – Eases management and provisioning of multiple RD&T instances

§ **High Capacity License Tokens**

- – Available for RD&T server users
- – Allows multiple zPDT instances licensed from a single token
- – Supports up to 30 RD&T servers (3 CPs) per token

§ **Scripts and tools to assist with setup and provisioning**

Flexible configurations
Available since April 24, 2012

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§ RD&T, based on zPDT V1.3
– z196 architecture

§ Floating User licenses available

§ Updated ADCD license available
– z/OS V1.12 ADCD
– z/OS V1.13 ADCD

§ Option to purchase RD&T standalone
– Without the RDz Eclipse tooling

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Everybody can get RD&T

Rational. software

- **Benefits**:
  - Simple sandbox environment for z/OS
  - Available worldwide
  - Includes:
    - zPDT technology (and defect zPDT support)
    - z/OS Software stack (ADCD)
    - Rational Developer for System z tool suite (optional)
  - Does not require IBM System z Developer Discount Program

- **Note:**
  - Available with Authorized User and/or Floating User license
  - Capable of supporting multiple users
  - **z/OS ONLY** – Additional IBM or 3rd party SW have to be licensed separately
  - Certain zPDT functions are not available in RD&T, e.g. Parallel Sysplex and z/VM not allowed (see RD&T terms & conditions)
  - May not be used for production workloads including without limitation production module builds, pre-production testing, stress testing, or performance testing.

Ordering RD&T: Program Number 5725-G39

Rational. software

§ **To build your own system, contact IBM Passport Advantage**

- http://www-01.ibm.com/software/howtobuy/passportadvantage/index.html
- Physical delivery of USB key (IBM 1091 security key) required
- Physical or electronic delivery of corresponding software media

§ **For a complete working system, contact IBM Sales for an authorized reseller**

Worldwide	Michael Farland Rational Enterprise Modernization Sales Executive	+1-952-474-0595 mfarland@us.ibm.com
US	Andy Sykes Rational Software Sales Leader, US and Canada	+1-781-929-0756 amsykes@us.ibm.com

§ **Order RD&T from selected business partners (DVD and IBM 1091 security key)**

Worldwide	Information Technology Co. LLC PO BOX 688 Falls Church, VA 22040 www.p390.com	John Cotte +1-800-994-9441 +1-703-237-7370 sales@p390.com
US	ClearBlade, LLC 2006 Indian Trail Austin TX 78703 http://www.clearblade.com/	Eric Simone +1-512-686-3037
Europe	QGroup http://qgrp.com/index.php	Stefan Schneider http://qgrp.com/index.php?show=kontakt

IBM Rational Customers – Get a complete working system

§ **Purchase a complete, ready-to-use mainframe application development system**

  – **R**ational **e**nhanced **D**evelopment **D**evice – System **ReDD**

§ **System ReDD is available worldwide through Information Technology Company, LLC (ITC)** **-** a vendor with over 30 years of experience with mainframe hardware, software, and services.

§ **Benefits of ITC's System ReDD:**

  § Run Windows client, Rational Developer for System z with Java, EGL, or zEnterprise (RDz) and Rational Development and Test Environment (RD&T) on _**ONE**_ _PLATFORM_

   § Individual components are installed, configured and optimized to work together seamlessly
   § Reduces complexity - provides fast deployment of a fully functional RD&T-based system
   § Developers can focus their time on new System z applications, not on infrastructure build out

  § Available as single-user (laptop) and multi-user (server models) on supported x86 hardware

  § Technical support, customization, System **ReDD** operational training, and management tools & utilities

  § Available Worldwide

Comparing the zPDT-based offers

RD&T vs zPDT - Software Stack

§ **IBM System z Developer Discount Program, full software stacks for:**

- § **z/OS ADCD** (Application Development Controlled Distribution) includes z/OS and IBM z/OS stack middleware
- § **z/VM ADCD** includes z/VM and select associated products
- § **z/VSE ADCD** includes z/VSE and select associated products
- § For more info on ADCDs and for complete software list, see http://dtsc.dfw.ibm.com/adcd.html

- § **Linux for System z**, as available to PartnerWorld developers through IBM Passport Advantage

- § **Additional third party software**, contact your third party vendor

§ **Rational Developer and Test Environment (z/OS ADCD subset):**

- § **z/OS MLC Products**
  - – **z/OS V1.12 and z/OS V1.13 Base** (and all sub features)
    - • Languages and compilers for development and testing
    - • Enterprise COBOL
    - • Enterprise PL/I
    - • XL C/C++
    - • REXX™
    - • JCL- Assembler- Language Environment
  - – **IMS V11.1**
  - – **DB2 for z/OS V9.1 and V10.1**
  - – **WebSphere MQ for z/OS V7.0**
  - – **Enterprise COBOL V4.2**
  - – **Enterprise PL/I z/OS V4.1**
  - – **Java SDK for z/OS V5.0 and V6.0**
  - – **XL C++ V1.12 and V1.13**
  - – **CICS TS for z/OS V3.2, V4.1 and V4.2**

- § **z/OS OTC Products**
  - – **WebSphere Application Server for z/OS 7.0 and V8.0**
  - – **DB2 Utilities Suite V9**
  - – **Debug Tool V11.1**

- § **Other Tools pre-installed**
  - – **Rational Developer for System z**
  - – **Rational Cobol Runtime V6.0 (EGL)**
  - – **RTCz file/build agents**
  - – **RDz RSE and Job Monitor**

http://www-01.ibm.com/software/rational/products/devtest/systemz/

RD&T vs zPDT – Support

§ **RD&T for commercial customers:**
  – RD&T (IBM program number 5725-G39) is licensed under the IBM International Program License Agreement (IPLA)
  – Problems should be reported through IBM's standard problem reporting channels, or through the **RD&T forum**.   http://www.ibm.com/developerworks/forums/forum.jspa?forumID=2283
    • The forum is intended for discussions about the RD&T environment itself and basic z/OS ADCD questions.
    • IBM makes no warranties that problems submitted to the RD&T forum will be addressed or resolved.

§ **zPDT for ISVs:**
  – zPDT software is non-warranted
  – Problems should <u>not</u> be reported through IBM's standard problem reporting channels, but can be reported to the **zPDT forum**.   http://groups.yahoo.com/group/z1090
    • The forum is intended for discussions about zPDT itself and basic ADCD questions.
    • IBM makes no warranties that problems submitted to the zPDT forum will be addressed or resolved.

§ **ITC's Ultimate Personal Development Tool (uPDT) is supported by ITC.**
§ **ITC's Rational Enhanced Development Device (ReDD) is supported by ITC.**

RD&T vs zPDT – Pricing

§ **RD&T for commercial customers:**

1. License includes:
   - zPDT technology (and defect zPDT support)
   - Subset of z/OS ADCD as mentioned before
   - Rational Developer for System z tool suite (optional)
2. Licensed per year, <u>per user**</u>
   - Authorized User license = US $8,500* for first year, 20% S&S for each following year
   - Floating User license = US $18,700* for first year, 20% S&S for each following year
3. System z SW provided by a subset of the z/OS ADCD
   - Annual subscription fee included in RD&T license fee
   - Unsupported, use 'as is'
4. zPDT defect support is included
5. Additional support and services available through authorized partners.

> ** Additional pricing options are available. See IBM or an authorized reseller for details.

§ **zPDT for ISVs:**

1. License includes: The zPDT software, which is licensed per year for <u>unlimited users</u>
   - The 1090 USB hardware key (1090, -L01, -L02, -L03) is US $299* OTC
   - 1-way zPDT SW defined by a 1090-L01 is US $3,750* per year
   - 2-way zPDT SW defined by a 1090-L02 is US $7,500* per year
   - 3-way zPDT SW defined by a 1090-L03 is US $11,250* per year
2. System z SW provided by z/OS ADCD, z/VM ADCD, or z/VSE ADCD
   - US $900* annual subscription fee
   - Unsupported, use 'as is'
3. Additional support and services available through ITC.

> * **NOTE**: Prices are suggested for US only. Prices for other countries and regions will vary. The above reflects the current IBM pricing. IBM reserves the right in its sole discretion to, among other things, change one or more of the foregoing without notice.

Summary of zPDT-based Offerings

Offer	zPDT as part of [ISV] System z Developer Discount Program	RD&T (IBM number 5725-G39)
Availability	WW, may not be available in some countries	WW, may not be available in some countries
Configuration	Up to 3 CPs - available as piece parts - build-it-yourself - Turnkey - multiple options - Can be used on a laptop or server	Up to 3 CPs - available as piece parts - build-it-yourself - Turnkey - multiple options - Can be used on a laptop or server
Usage restrictions	No production workloads. Complete development/test cycles. Can also be used for product support, demo, and internal education.	No production workloads. Development through UT. Production level compiles cannot be done on RD&T, must have access to a production z/OS system with compiler. Can also be used for demo and internal education.
SW availability	z/OS ADCD, z/VM ADCD, and z/VSE ADCD stacks. Can also order additional z SW via Shopz.	Subset of z/OS ADCD stack. Can get add'l z SW, based on mainframe entitlement.
License	Annual license PER MACHINE (1090). Must be renewed annually.	Annual license PER USER. Purchase includes 1 year of service and zPDT support including upgrades. Additional years of S&S and/or upgrades can be obtained at additional cost.
Support	HW token warranted for 1 year. zPDT SW unwarranted. z SW provided on ADCD stack is unwarranted. Various levels of support provided on forums and through BPs (w/ charge)	HW token warranted for 1 year. Additional years can be purchased. zPDT SW warranted for 1 year. Additional years can be purchased. z SW provided on ADCD stack is unwarranted. Various levels of support provided on forums and through BPs (w/ charge)
Fulfillment	ITC (Information Technology Company), worldwide.	ITC (Information Technology Company), worldwide. PPA, self service in some countries. Rational authorized resellers available.

More information

§ zPDT for ISVs (IBM PartnerWorld membership required)
- **Home:** http://www.**ibm.com**/partnerworld/pwhome.nsf/weblook/pat_sas_zpdt.html
- **Forum:** http://groups.yahoo.com/group/z1090

§ ITC (Information Technology Co. LLC)
- **uPDT:** http://www.p390.com/pdf/uPDTOverview.pdf
- **System ReDD:** http://www.p390.com/pdf/System_ReDD.pdf

§ Rational Development and Test Environment for System z
- **Home:** http://www-01.ibm.com/software/rational/products/devtest/systemz/
- **Forum:** http://www.ibm.com/developerworks/forums/forum.jspa?forumID=2283

§ 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
  - System z Personal Development Tool Volume 4: Coupling & Parallel Sysplex   SG24-7859

- 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

Backup

ISVs - Upgrading IBM zPDT technology

§ **If purchased from ITC, you can "upgrade" zPDT technology :**

1. **Wait until your current zPDT license expires within the year and then purchase a larger (L02 or L03) license.**

   – ITC will send you new code and token and issue an 'MES' that will upgrade your license and agreement.

   – It is important to time the new license with the expiration of the old license, no credits are issued for unused time on licenses.

2. **Purchase an additional zPDT license from ITC (and get additional token) for the additional capacity you need.**

   § Example: In going from an 'L01 to an L02' you would purchase an additional L01 and use the two tokens in the same machine at the same time.

   § There is no performance nor pricing benefit of a singe L02 versus two L01s.

   § With multiple tokens you have the advantage of running them together for a larger system, or separately for smaller systems. Due to performance reasons, the number of virtual zPDT engines is not to exceed 3 (an L03).

   § Note: A disadvantage is that you have to manage multiple tokens with separate expirations.

§ **There are no downgrades**

RD&T - Important notes

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§ IBM Rational Development and Test Environment for System z does not produce an environment equal to a larger System z for all testing scenarios. Some aspects of a larger system are unlikely to be met in any small environment. These include the ability to verify and enhance the scalability of a program under development, run application programs that require a large number of MIPS, or to use unique hardware requirements only found on a mainframe. A larger System z is needed for these areas of development. Likewise, Rational Development and Test Environment for System z is not recommended for very fine-level performance tuning that is sensitive to memory location, cache functions, and pipeline optimization. Larger System z machines have different characteristics than the IBM Rational Development and Test Environment for System z at this level.

§ In addition, IBM Rational Development and Test Environment for System z does not nearly have the same quality of service as does a mainframe in terms of availability and connectivity. For these and other reasons, the IBM Rational Development and Test Environment for System z is not intended as a replacement for a larger system. IBM recommends the final testing of software be done in an environment as close as possible to what would be run in production. This requires a stress test environment that can only be satisfied with the capabilities delivered by a System z server.

§ IBM Rational Development and Test Environment for System z may not be used for production workloads of any kind, nor robust development workloads including without limitation production module builds, pre-production testing, stress testing, or performance testing.

zPDT 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
```

zPDT 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
```