what's new with DevOps on z

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Agenda

- What is DevOps
- Analyze
- Provision environment (Cloud)
- Check out code (SCM)
  - Develop/change
  - Build + Unit test + debug
  - Code review
- Deploy to next level in CICD Pipeline

So what is DevOps ?

- DevOps is a set of **practices**
- intended to **reduce the time** to move change to production
- while ensuring **high quality**

DevOps is about **Culture**...

It´s about

- **collaboration** across roles
- focus on **business**

  not departments
- **learning** by experimenting

It´s all about **people**

Why DevOps ?

- Shorten **time to value** – *“from concept to cash”*

- Increased **capacity to innovate**

- Enhanced **customer experience**

Why DevOps ?

Rise of Devops influenced by:

- Spread of **Agile/LEAN** development
- Introduction of (private) **Cloud**
- Move to a **Microservices** architecture

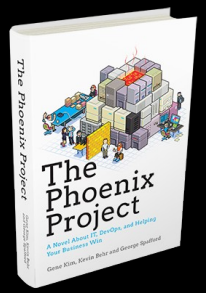
DevOps is about
“the three ways”

1st way **Systems Thinking**

2nd way amplify **Feedback Loops**

3rd way **Continuous Experimentation & Learning**

… this is explained in book “The Phoenix Project”



DevOps is about
“the three ways”

1st way **Systems Thinking**

- **Business** Value stream
  - **Not** the department or silo of work
- Begins with **Business requirements**

2th Way: **Feedback loops** (and Shift Left testing)

"80% of development costs are spent identifying and correcting defects" **

During the Coding or Unit Testing phases

$80/defect

During the BUILD phase

$240/defect

During Quality Assurance or the System Test phases

$960/defect

Once released into production

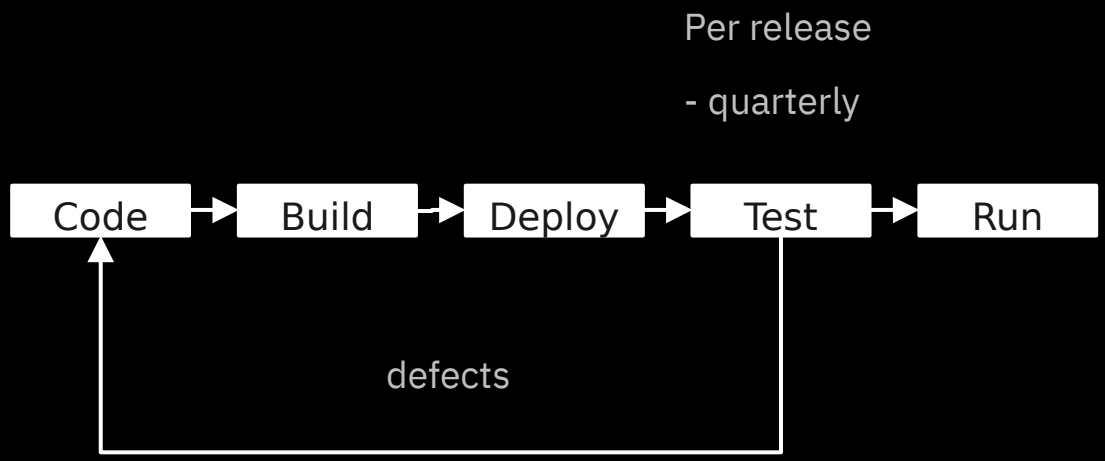
$7,600/defect
+
Law suits, loss of customer trust, damage to brand

**National Institute of Standards & Technology

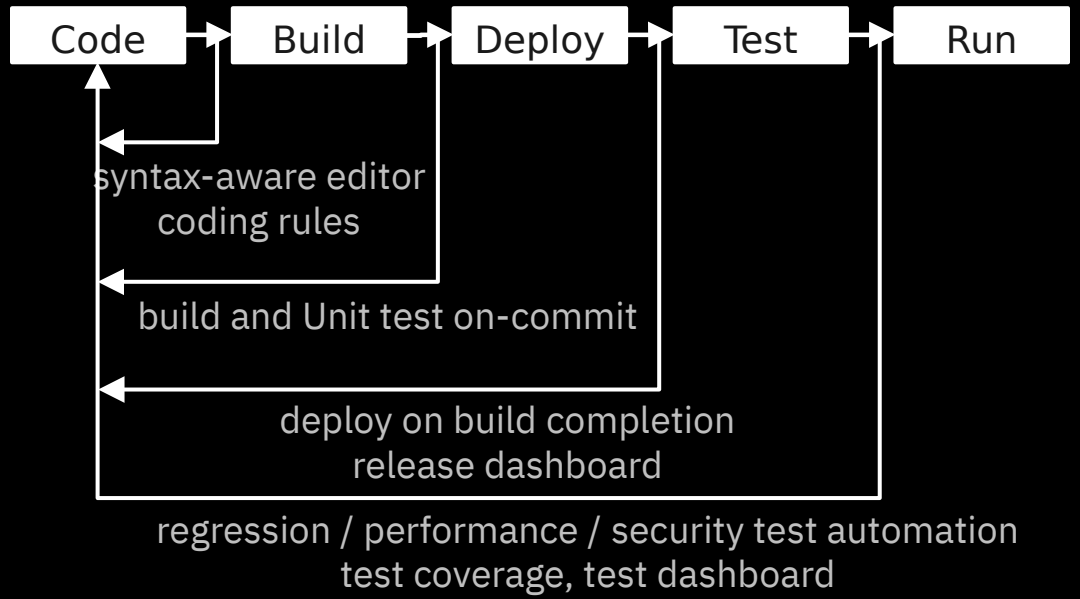
Source: GBS Industry standard study

Defect cost derived in assuming it takes 8 hours to find, fix and repair a defect when found in code and unit test.
Defect FFR cost for other phases calculated by using the multiplier on a blended rate of $80/hr.

Waterfall feedback loop



DevOps feedback loop



DevOps is about
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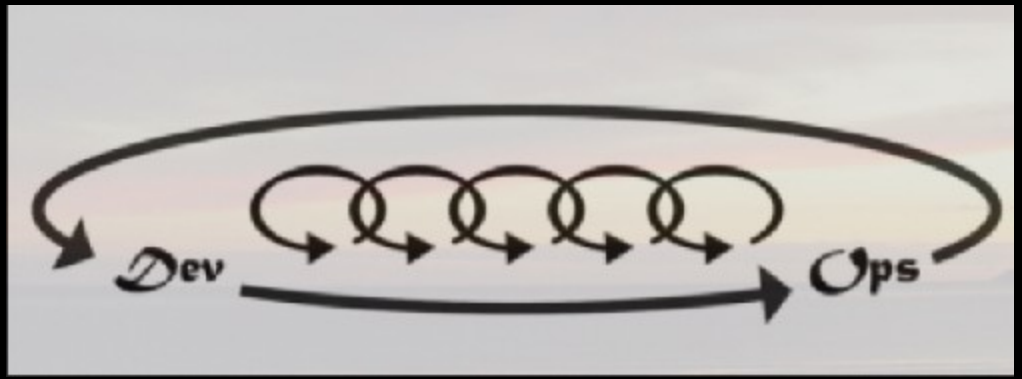
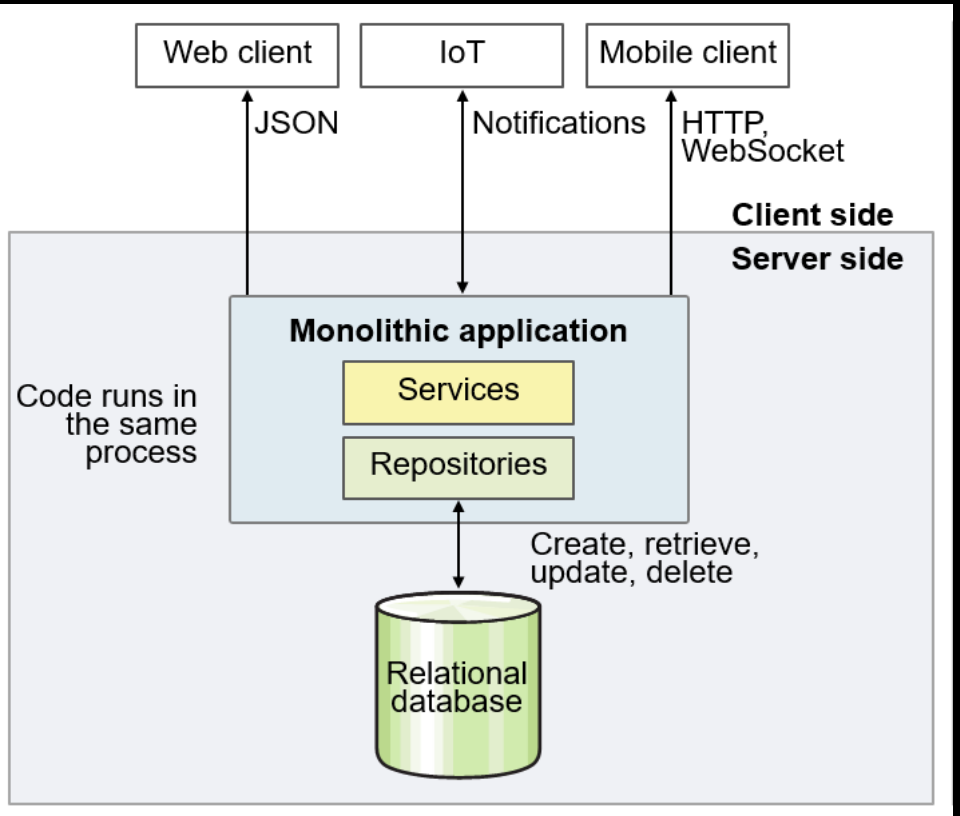
3rd way **Continuous Experimentation & Learning**



MicroServices break up applications in manageable parts to improve business agility, and leading to many smaller parts



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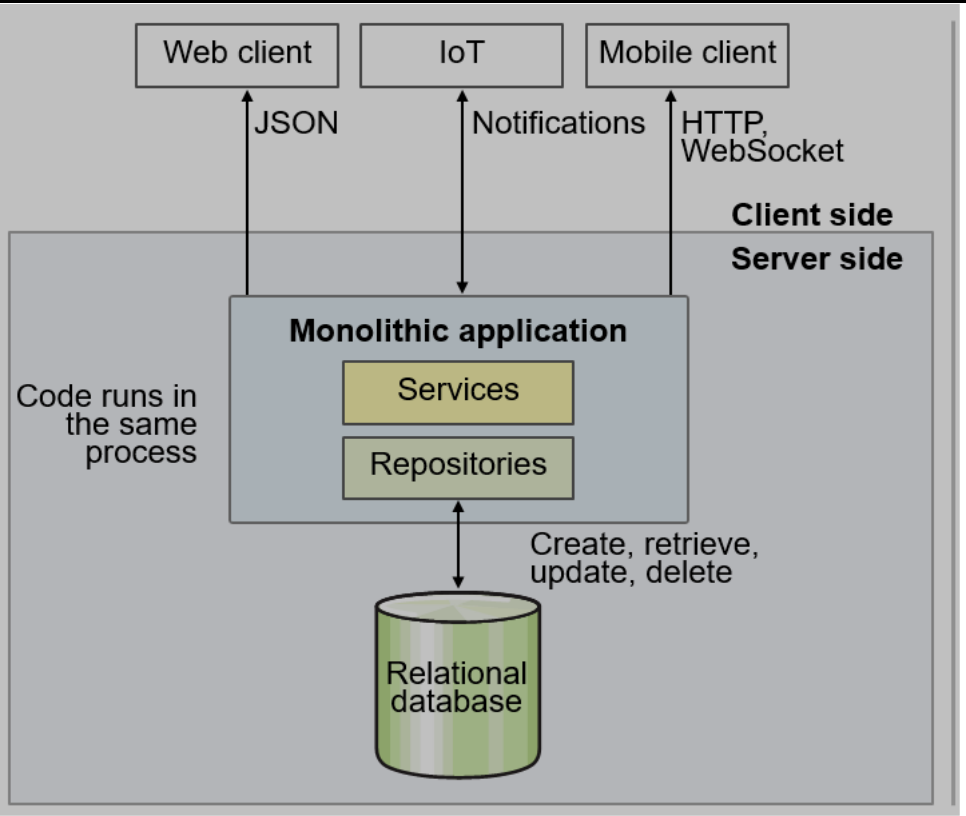
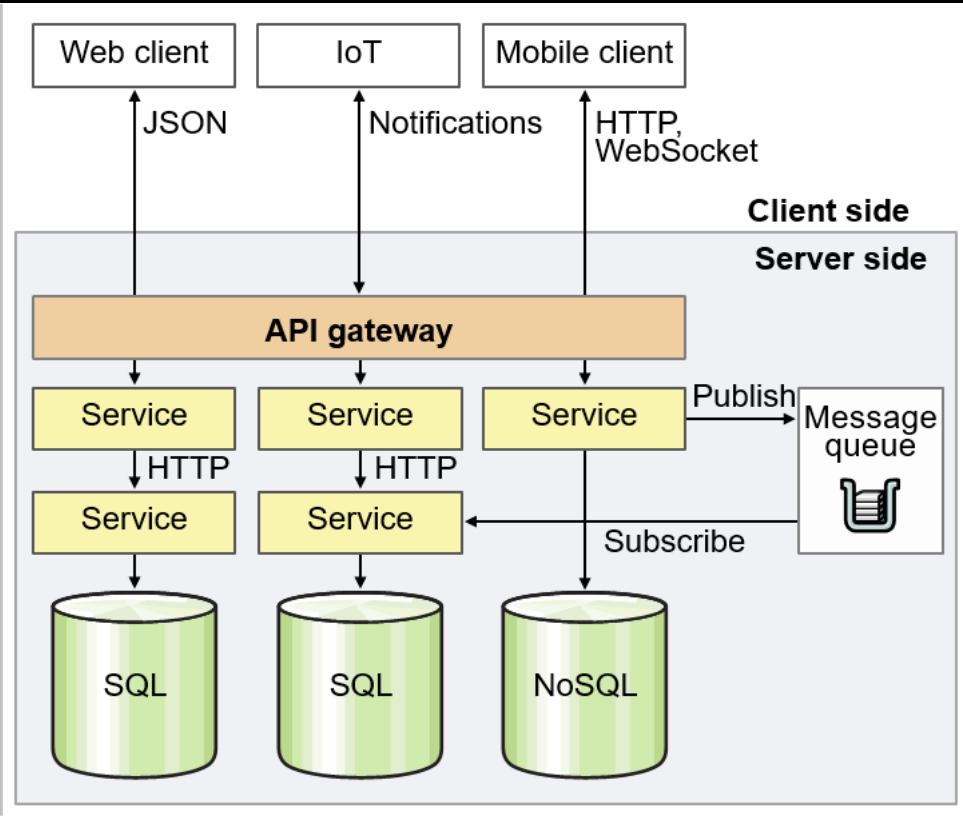
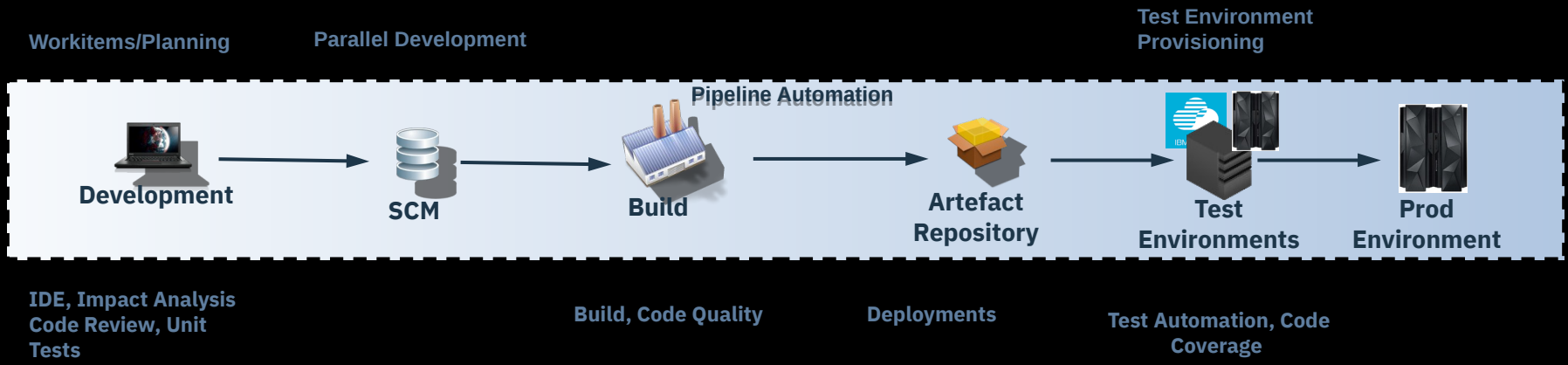




CI/CD Pipeline

DevOps Engineer: what could his day look like in 2020

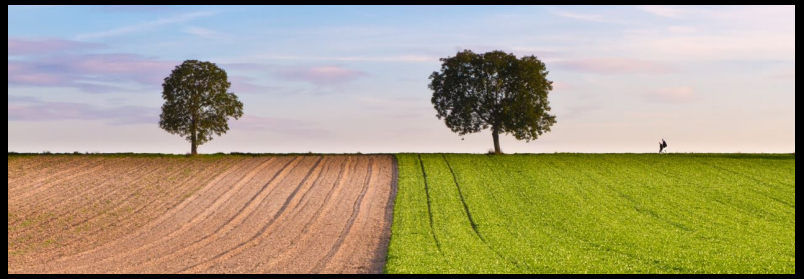


To design a toolchain

- Clarify **requirements**
- Make **design decisions**

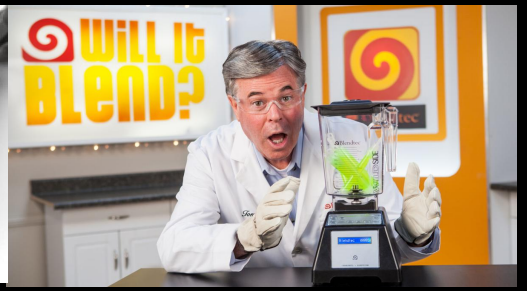
#architecture

Build for **brownfield** or **greenfield** ?

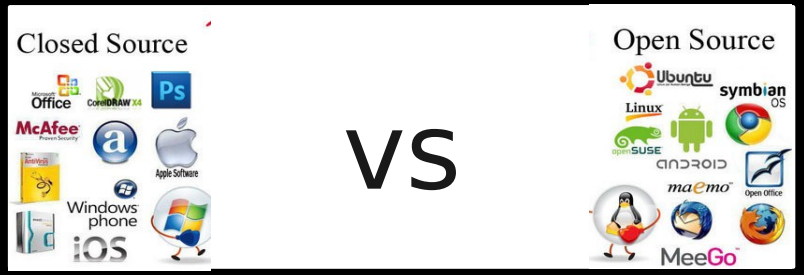


What **existing tools** do you have ?

Will the toolchain **integrate** ?



Do we prefer **open source** or **Vendor tools** ?

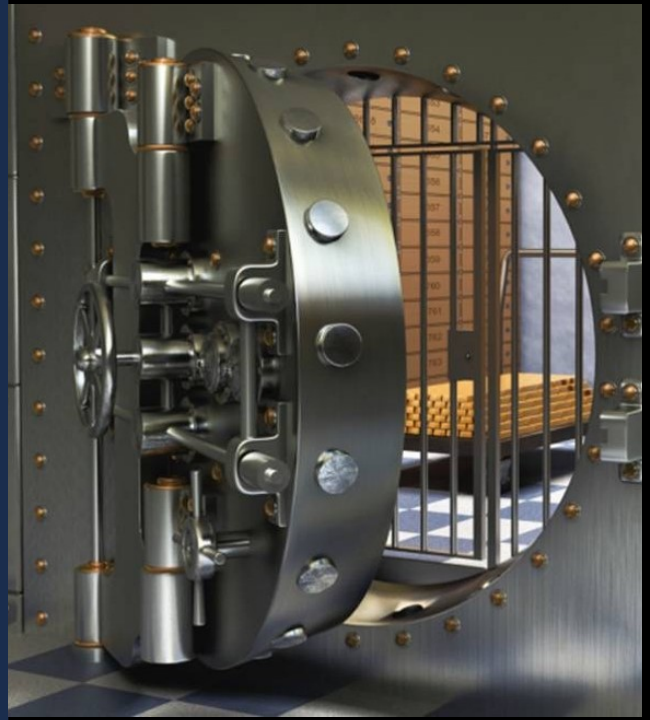


What do **other companies** do ?

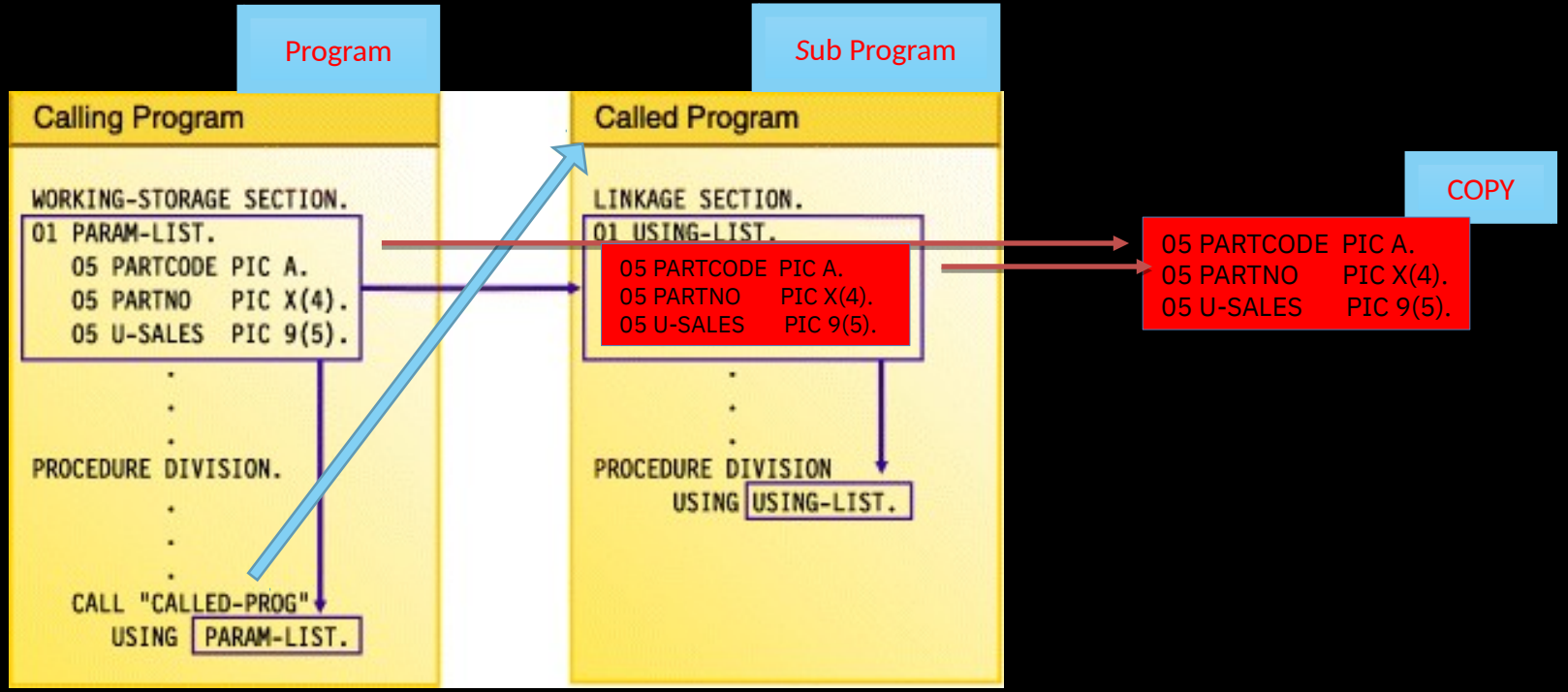
Do we have the right **skills** ?

Analyze

Task: make a change to this 20 year old program but don’t break everything else

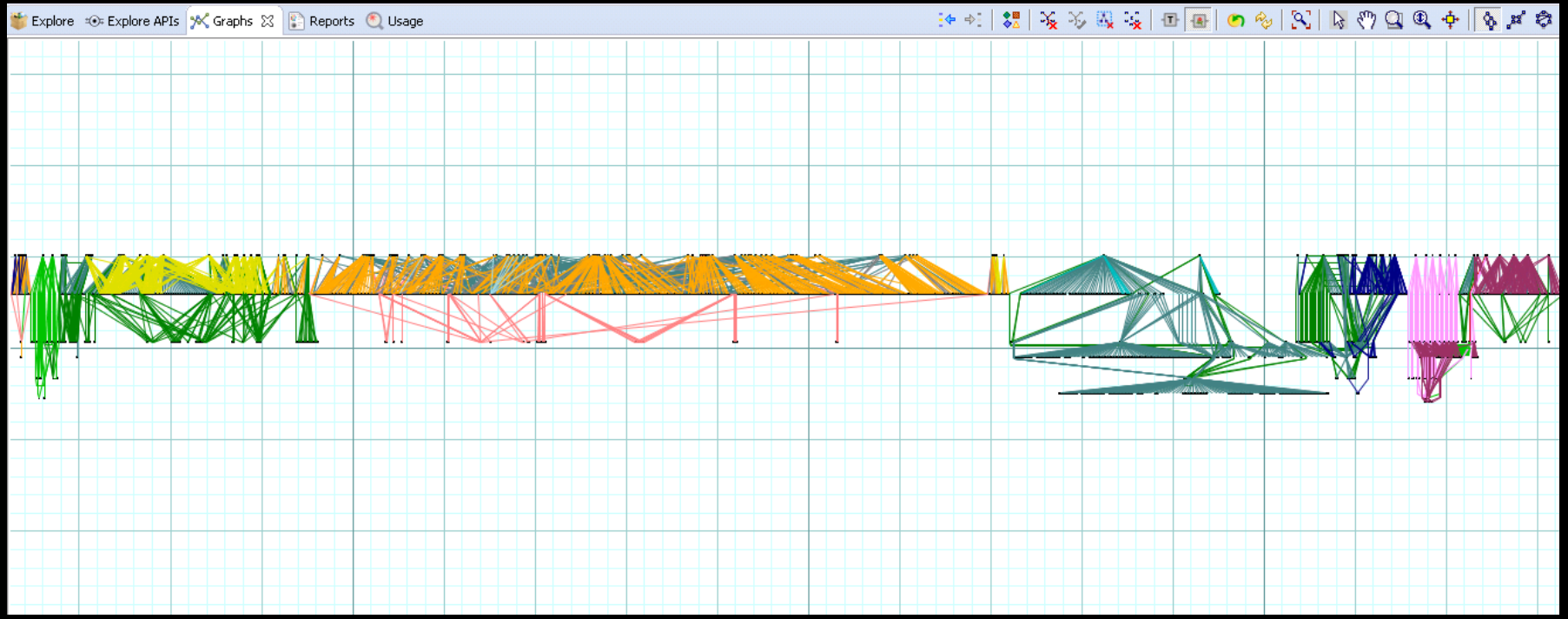


The challenge of managing dependencies between applications



Breaking down the application:

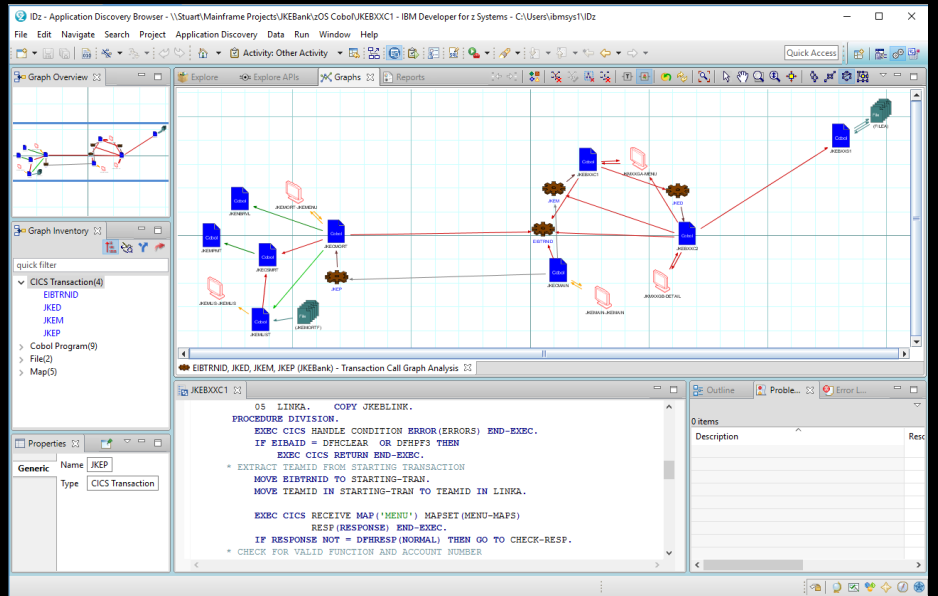
Complex source code presented in call graph layout



Analyze

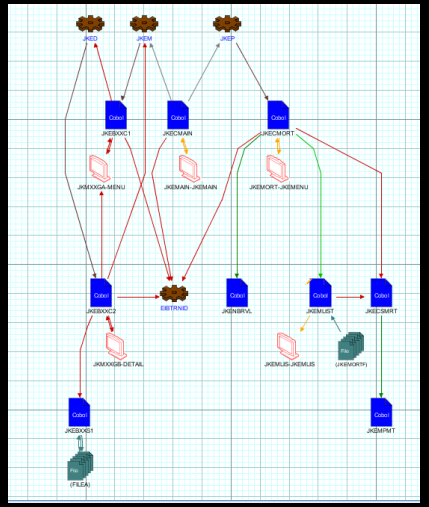
Using Application Discovery

- Eclipse based
- Integrates with Idz, zD&T

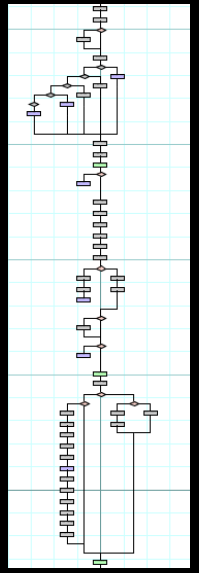


Analyze

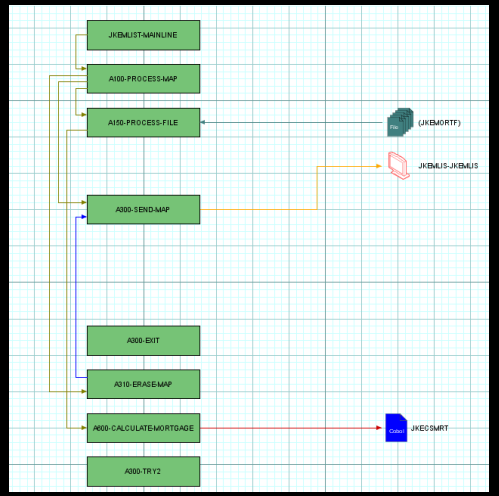
Using Application Discovery



Transaction Call Graph



Program flowchart



Program flow

IBM ADDI Supported Environments

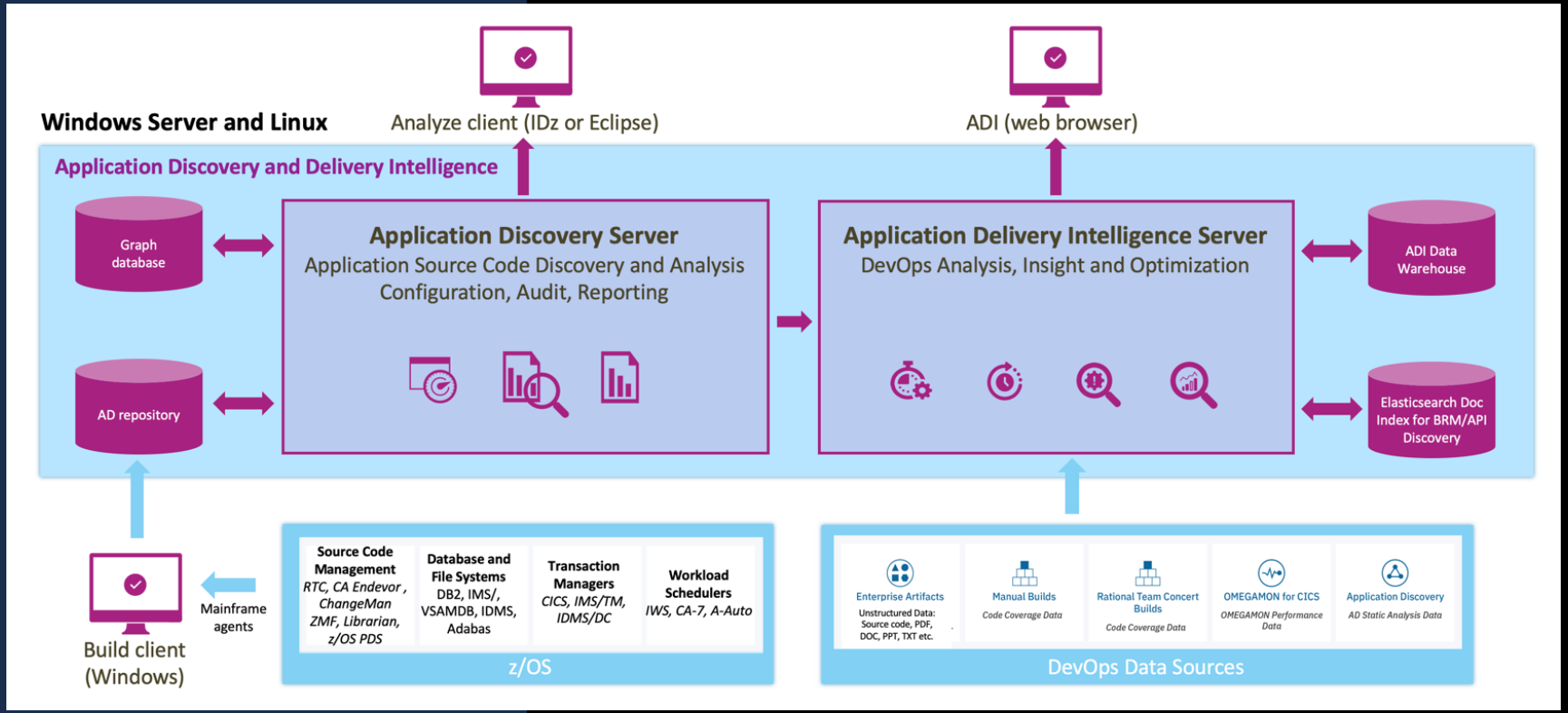
Mainframe – z/OS

- Languages – COBOL, PL/I, Assembler, Natural, CA ADS/Online
- Databases - VSAM, DB2, IMS/DB, Datacom, Adabas, IDMS
- Batch – JCLs, Procs, Ctrl
- TP monitors – CICS, IMS/TM, IDMS/DC
- Schedulers – IWS, A-Auto, CA7
- Messaging – MQ
- SMF analysis – Jobs, CICS Transactions
- SCM – RTC EE, Broadcom Endevor, Librarian, Serena ChangeMan ZMF, z/OS PDS, ITC
- AD tools – ADFz, IDz
- Monitoring – OMEGAMON for CICS
- API connectivity – z/OS Connect

Distributed

- Languages – Java

IBM ADDI Architecture



Provision: zD&T

- Run z/OS local on any Intel server
  - For Development and Test
  - Everyone their own environment
  - Adaptable to the developer’s needs

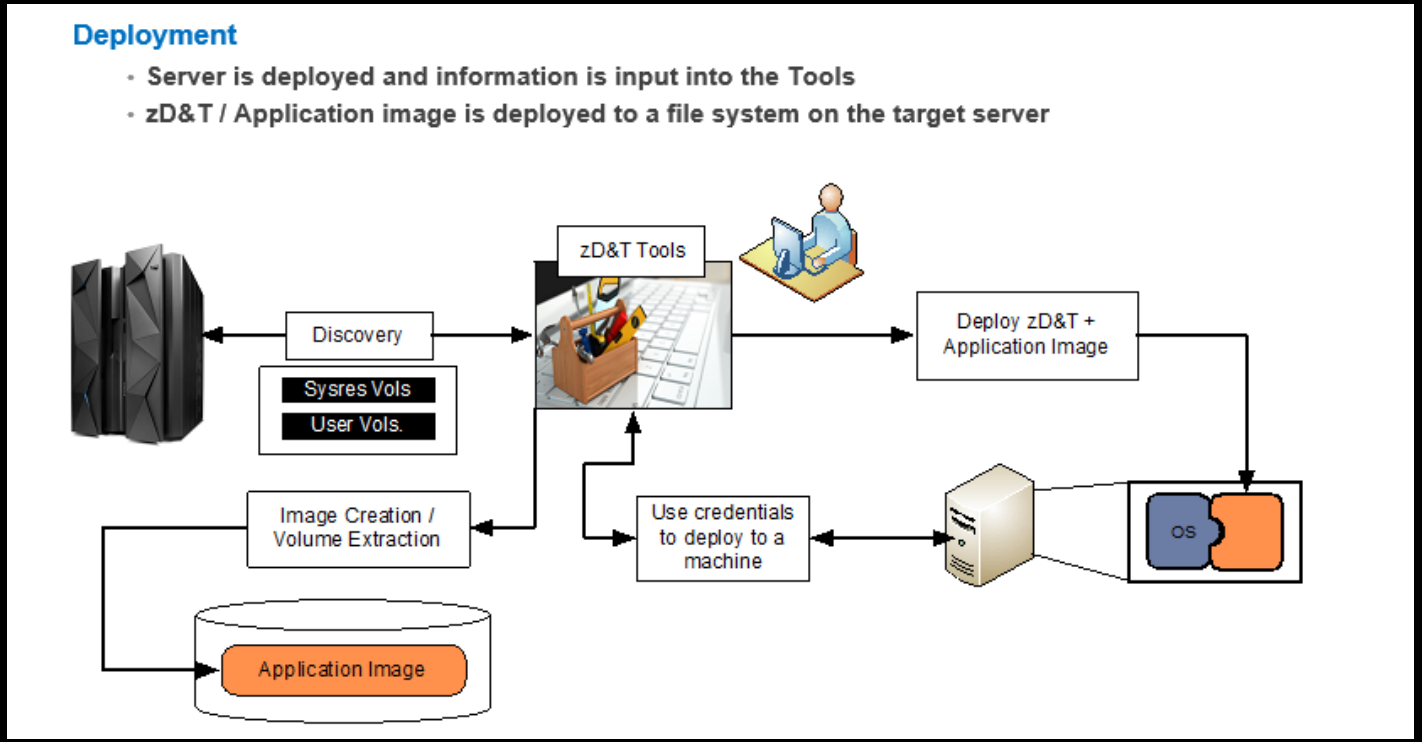
Provision: zD&T

Two main options:

- Use the provided ADCD Volumes
  - Needs tweaking to get a production-like environment
  - Need to add user data and sources
- Use Volume cloning to create Volumes
  - Needs a real LPAR to clone from

In both cases: Create a “golden copy” to spin off zD&T instances

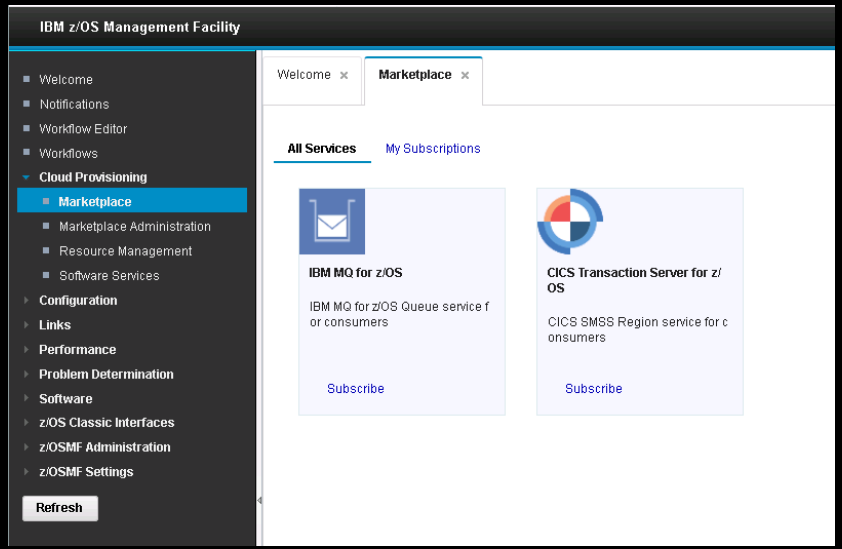
ZD&T EE – Provisioning with Application Discovery



- Integration with Application Discovery; used to identify data sets and CICS resources used by an application. The identified data sets can then be automatically provisioned with other components to a new ZD&T instance

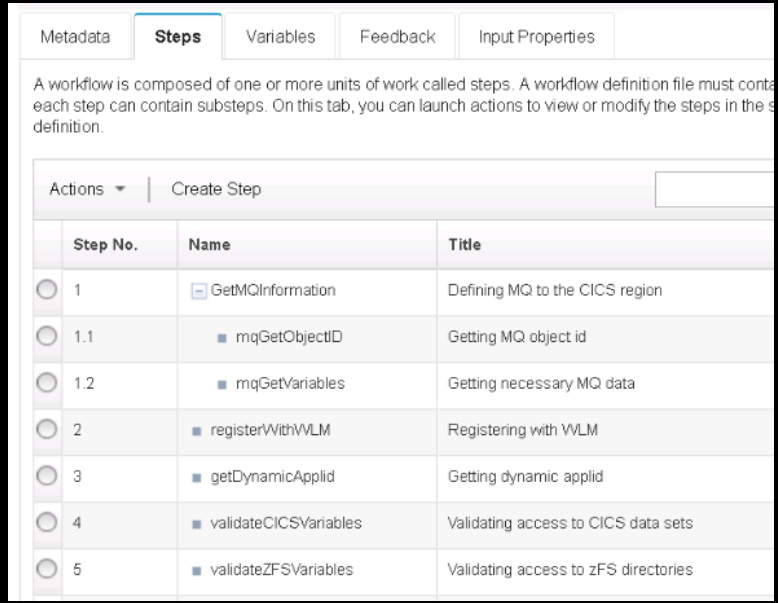
Provision: z/OS Subsystems

- Z/OSMF Provisioning Toolkit
- IBM templates for CICS, MQ, DB2, …
- “Home grown” z/OSMF flows
- Dashboard

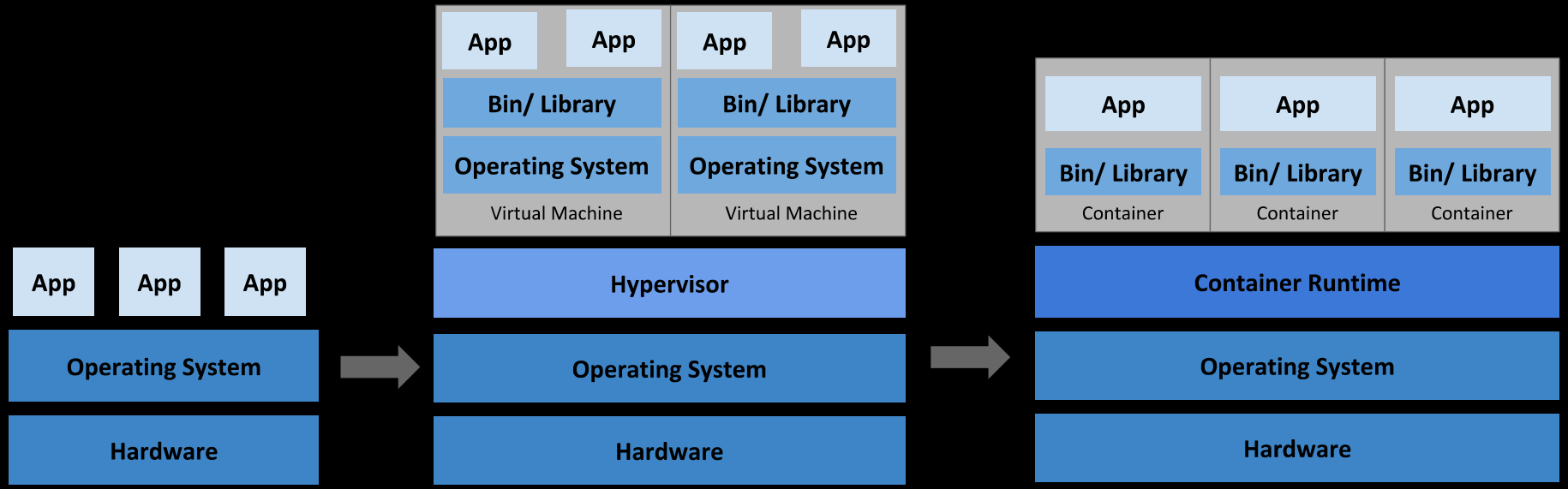


Provision: z/OS Subsystems

- A Sysprog will provide the templates
  - Defines the definition
  - Decides what parameters, if any the developer will provide
- Developers can select a template



Kubernetes

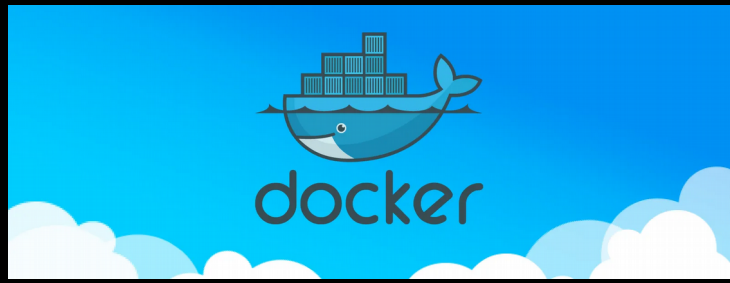

App
App
App
Operating System
Hardware
Traditional Deployment
App
App
App
App
Bin/ Library
Bin/ Library
Operating System
Operating System
Virtual Machine
Virtual Machine
Hypervisor
Operating System
Hardware
Virtualized Deployment
App
App
App
Bin/ Library
Bin/ Library
Bin/ Library
Container
Container
Container
Container Runtime
Operating System
Hardware
Containerized Deployment

Provision: z/OS Cloud Broker

- Bridge between z/OS services and Red Hat OpenShift (with Kubernetes)
  - Services can be built in z/OSMF
  - z/OS Cloud Broker runs in a Docker pod in OpenShift

Provision: zCX

- Z Container eXtensions
  - Linux workloads on z/OS
  - As close as you can get to your back-end

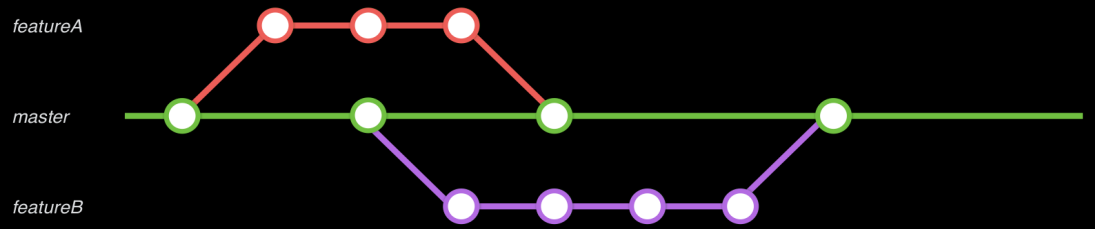


Checks out the code he will work on

RTC EE, Git, Azure Devops, ...

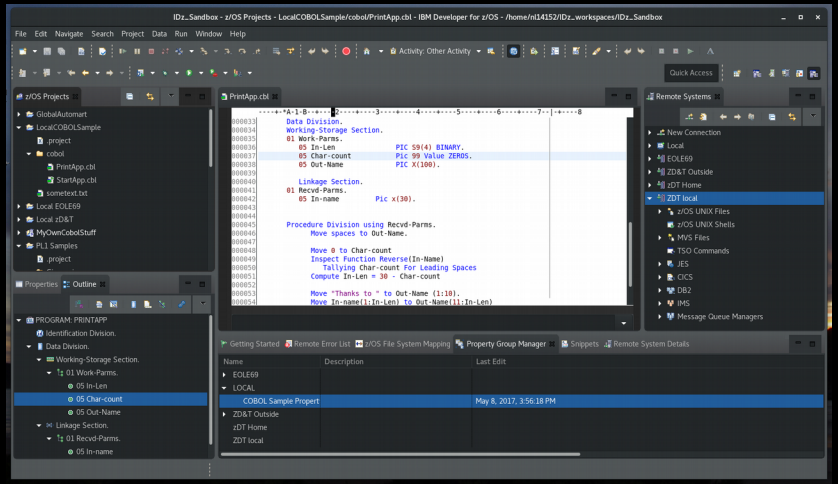
- Modern SCMs
  - Works with z/OS
    - And distributed systems
  - Source code repository does not have to reside on z/OS
- In combination with Dependency Based Build (DBB)

Parallel development with modern SCMs



Develop: IDEs

- ISPF vs modern graphical IDE
  - Debug
  - Unit test
  - SCM Integration
  - Coding rules



Unit testing: zUnit

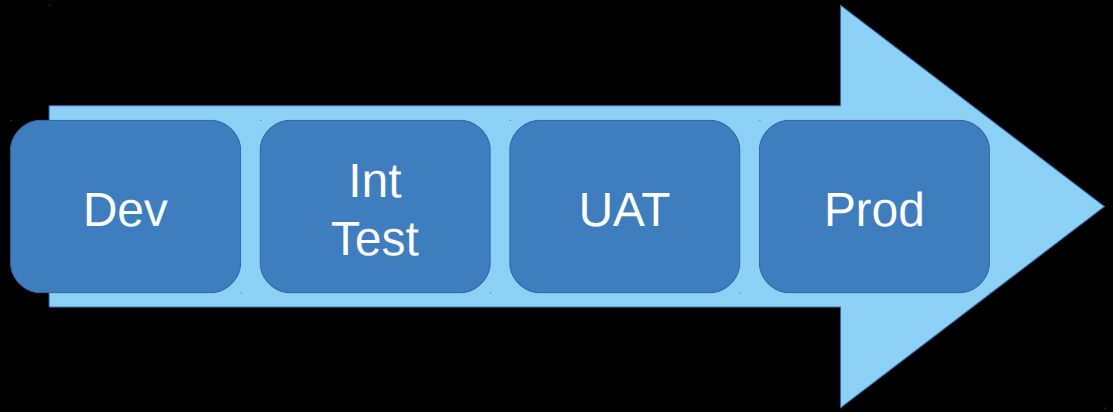
- Record CICS or IMS transactions
- Replay
- Generated test cases in your SCM with the code
- Run it automated after check in

Unit testing: zUnit

- Replay stubs out all the calls
- Makes it possible to do a unit test without having an actual CICS or IMS region available
  - Means zD&T can be simplified when using it just for unit testing

Deploy

- Check in your branch to RTC EE or Git or Azure Devops or …
- Perform an (automated) build
  - DBB, RTC EE, Maven, …
- Deploy to next level
  - UrbanCode Deploy, Jenkins, …



Questions?

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