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How to Tame a Dinosaur in 7 Steps: Mainframe Development with Eclipse

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Finanzgruppe

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Me, myself & I

- Thomas Zierer
- Lead Technical Architect
- BayernLB Dinosaur (since 10/1992)
- Interests: Everything that links the mainframe to the distributed world.

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Mainframe: What is it and why do we (still) do it?

Big Iron

- zSeries, System z9, z10, z/Enterprise
- Operating systems MVS, OS/390, z/OS
- Batch processing with JCL (Don‘t panic: No punch cards!)
- Programming Languages PL/I, COBOL
- 55% of all worldwide business applications involve mainframe code (Source: IBM (who else?))

Before we start

Demo

The traditional vs. The Eclipse Way

How to Tame a Dinosaur in 7 Steps

- Search!
- Find!
- Catch!
- Play!
- Train!
- Teach tricks!
- Parade!

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Step 1: Search!

- Hardest part indeed!
- z/Series uses *very* unique file system („VSAM“, „Physically sequential“, „Partitioned“, „Generation data groups“)
- Incomparable to Windows or Unix file systems
- Target Management Plugin (aka Remote Systems Explorer) only offers access to integrated Unix System Services, not native z/Series file system

Step 2: Find!

- Solution: IBM Explorer Family
  - Free of charge, Eclipse based, stand alone clients
  - Access to CICS, IMS, Fault Analyzer, File Manager or z/OS
  - Update Site: http://public.dhe.ibm.com/software/htp/zos/tools/1

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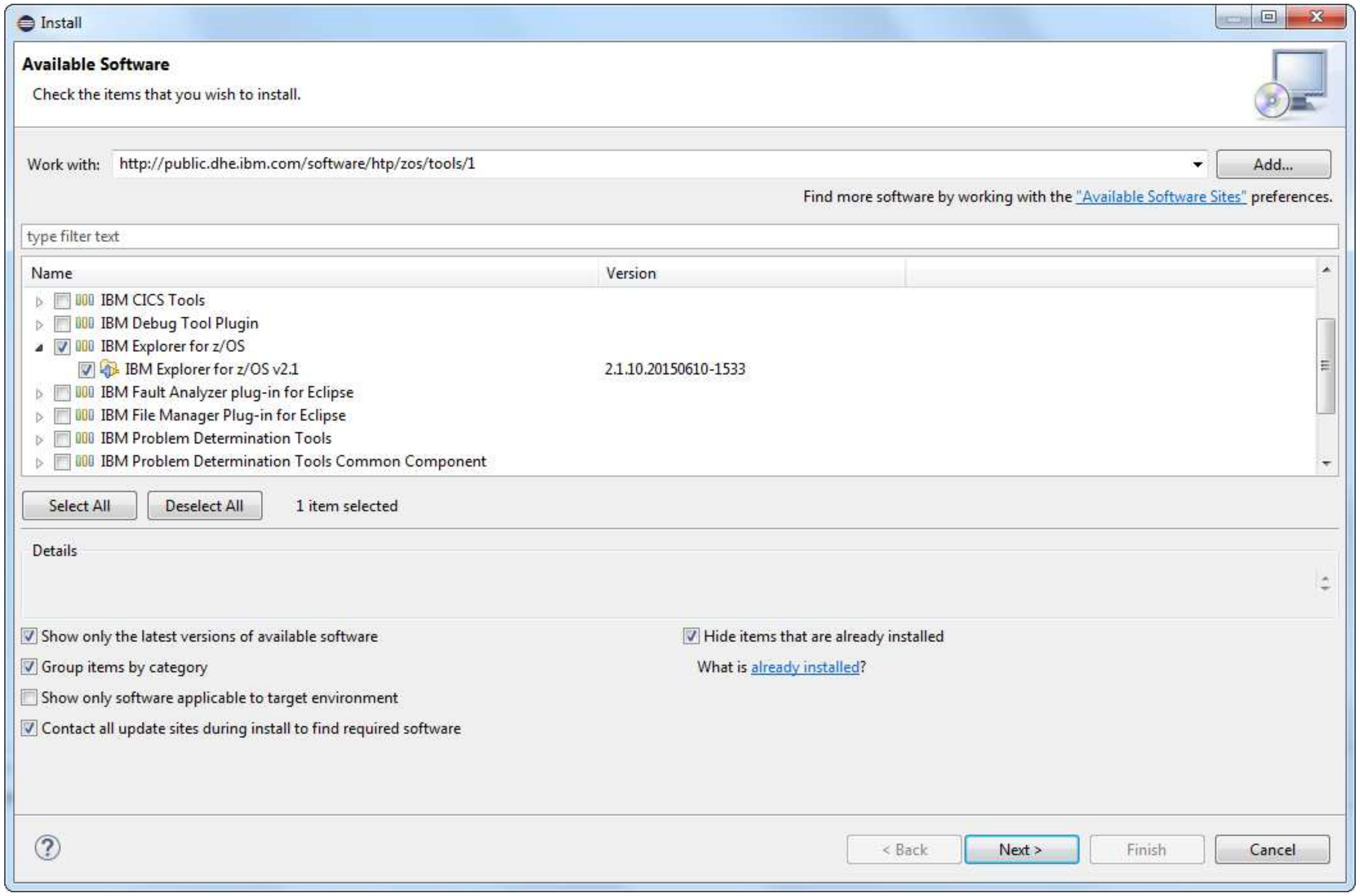
Step 2: Find!



Install

Available Software

Check the items that you wish to install.

Work with: http://public.dhe.ibm.com/software/htp/zos/tools/1 Add...

Find more software by working with the "Available Software Sites" preferences.

type filter text

Name	Version
☐ IBM CICS Tools	
☐ IBM Debug Tool Plugin	
☑ IBM Explorer for z/OS	
☑ IBM Explorer for z/OS v2.1	2.1.10.20150610-1533
☐ IBM Fault Analyzer plug-in for Eclipse	
☐ IBM File Manager Plug-in for Eclipse	
☐ IBM Problem Determination Tools	
☐ IBM Problem Determination Tools Common Component	

Select All Deselect All 1 item selected

Details

☑ Show only the latest versions of available software

☑ Group items by category

☐ Show only software applicable to target environment

☑ Contact all update sites during install to find required software

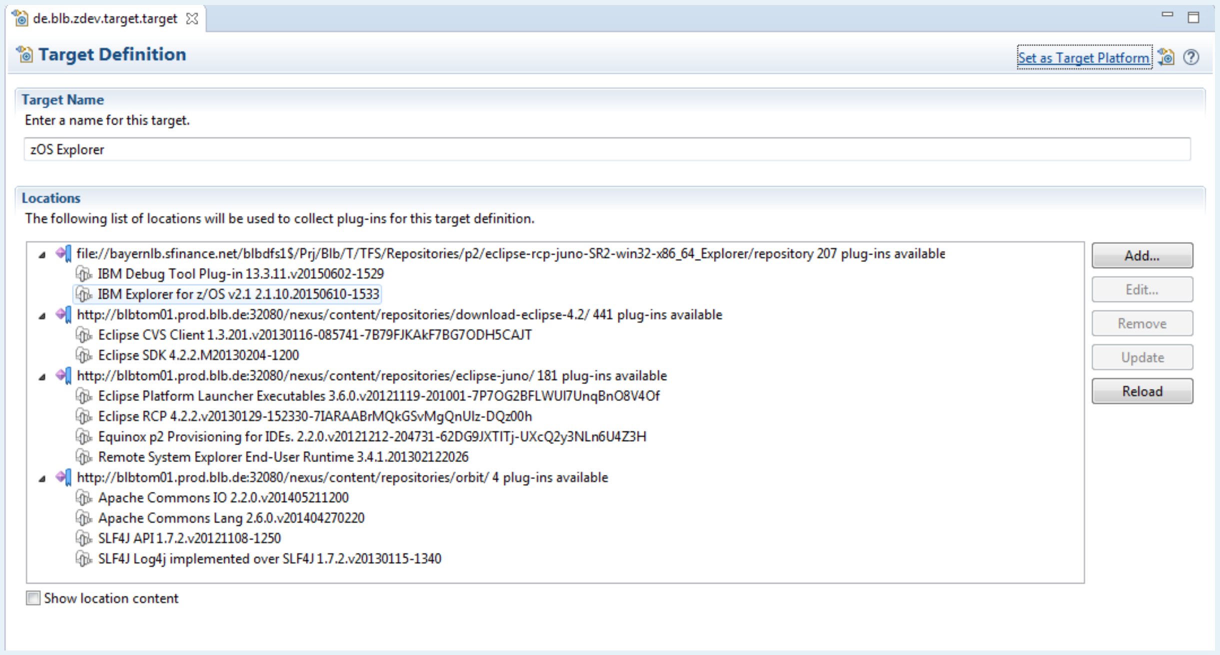
☑ Hide items that are already installed

What is already installed?

< Back Next > Finish Cancel

Step 3: Catch!

Simply include update site in target definition for your product or Tycho build



Target Name

Enter a name for this target.

zOS Explorer

Locations

The following list of locations will be used to collect plug-ins for this target definition.

```
file://bayernlb.sfinance.net/blbdfs1$/Prj/Blb/T/TFS/Repositories/p2/eclipse-rcp-juno-SR2-win32-x86_64_Explorer/repository 207 plug-ins available
    IBM Debug Tool Plug-in 13.3.11.v20150602-1529
    IBM Explorer for z/OS v2.1 2.1.10.20150610-1533
http://blbtom01.prod.blb.de:32080/nexus/content/repositories/download-eclipse-4.2/ 441 plug-ins available
    Eclipse CVS Client 1.3.201.v20130116-085741-7B79FJKAkF7BG7ODH5CAJT
    Eclipse SDK 4.2.2.M20130204-1200
http://blbtom01.prod.blb.de:32080/nexus/content/repositories/eclipse-juno/ 181 plug-ins available
    Eclipse Platform Launcher Executables 3.6.0.v20121119-201001-7P7OG2BFLWUI7UnqBnO8V4Of
    Eclipse RCP 4.2.2.v20130129-152330-7IARAABrMQkGSvMgQnUlz-DQz00h
    Equinox p2 Provisioning for IDEs. 2.2.0.v20121212-204731-62DG9JXTITj-UXcQ2y3NLn6U4Z3H
    Remote System Explorer End-User Runtime 3.4.1.201302122026
http://blbtom01.prod.blb.de:32080/nexus/content/repositories/orbit/ 4 plug-ins available
    Apache Commons IO 2.2.0.v201405211200
    Apache Commons Lang 2.6.0.v201404270220
    SLF4J API 1.7.2.v20121108-1250
    SLF4J Log4j implemented over SLF4J 1.7.2.v20130115-1340
```

☐ Show location content

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Step 4: Play!

Demo

Explorer for z/OS

Step 5: Train!

- Default editor is a notepad-lookalike
- Building a custom editor with Eclipse Text is easy
- Basically implement IPartitionScanner, IToken and Irule or extend default implementations.
- Include new editor as a fragment in z/OS Explorer data sets view

Step 6: Teach tricks!

- Support for code completion or automatic refactoring would require a language server application
- Limitations:
  - All tooling is mainframe based
  - Distributed compilers exist but are expensive and not 100% compatible
  - Compilelisting is meant to be read by humans

Step 6: Teach tricks!

- All IBM mainframe compiler support options for generating *some* compiler information as XML (COBOL: EXIT(ADEXIT(ELAXMGUX)))
- A variable typo appears like this

```
<MESSAGE>
<MSGNUMBER>IGYPS2121-S</MSGNUMBER>
<MSGLINE>24</MSGLINE>
<MSGTEXT>&quot;PRINREC&quot; was not defined as a data-name.</MSGTEXT>
</MESSAGE>
```

- This is everything we need to populate the problem view!

Step 6: Teach tricks!

- Allocate temporary dataset, suitable for XML data
- Generate a compile script in Job Control Language
- Transfer it to the mainframe and execute it
- Download the contents of the temporary dataset and parse it
- For every compiler message place a marker into the problem view and add an annotation to the editor
- And of course delete the XML dataset
- ZOSConnectable.getSingleton() does all the magic

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Step 7: Parade!

Demo

Remote debugging

Thank you very much for your attention!

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