

V O L V O

Jesienna konferencja Common Polska

20 Październik 2024, Wisła

The Art of Open

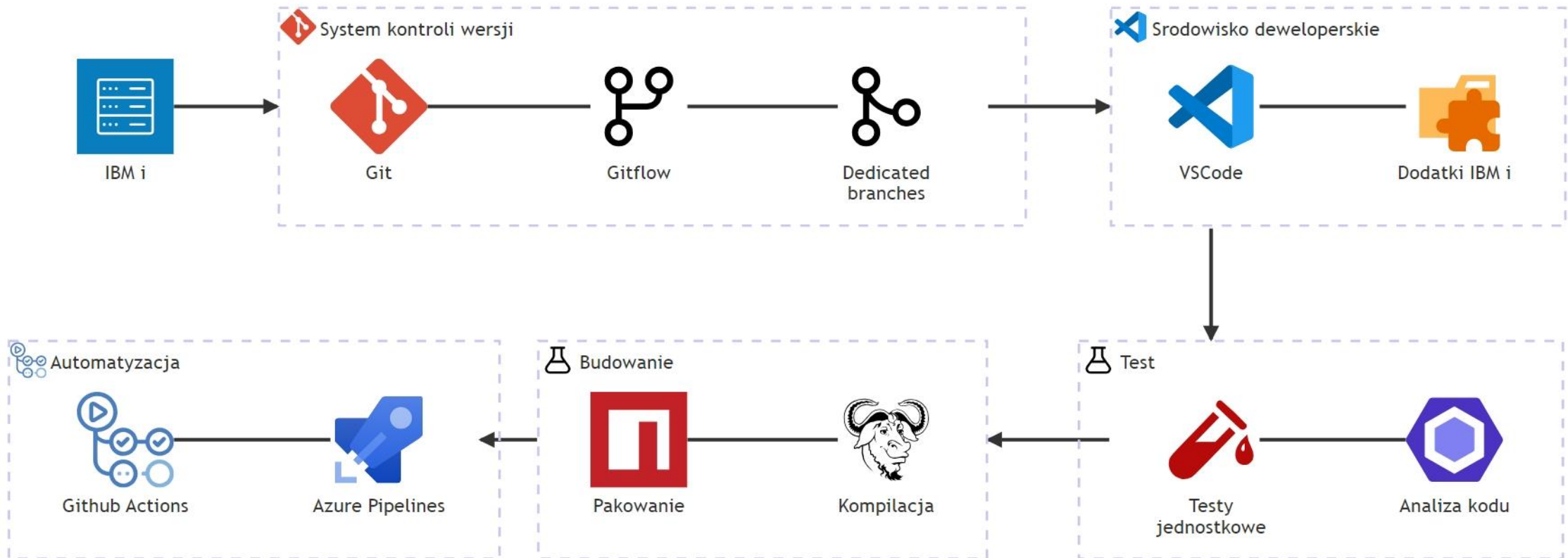
End to end development Process CI/CD

MARCIN OGOŃ



Plan spotkania

Wycieczka po otwartym oprogramowaniu



Serwer IBM i

Darmowe rozwiązanie

Welcome to PUB400

- A free and public Server running **IBM i 7.5** for everyone
- You can create your own user profile, you have 500MB of disk storage and two private libraries
- You can program in CL, RPG, SQL, COBOL, train your skills and start learning about the best server operating system ever :)
- Create your own programming projects, you can even use node.js or other web technologies (contact us for http settings)
- An average of 25 new users per day! Great IBM i community!

- Narzędzia
 - Terminal: TN5250J
 - SFTP: WinSCP
 - SSH: Putty

GIT

System kontroli wersji

Co to jest Git?

- Rozproszony system kontroli wersji
- Śledzi zmiany w plikach projektu
- Umożliwia współpracę wielu programistów
- Zapewnia historię zmian i możliwość powrotu do wcześniejszych wersji

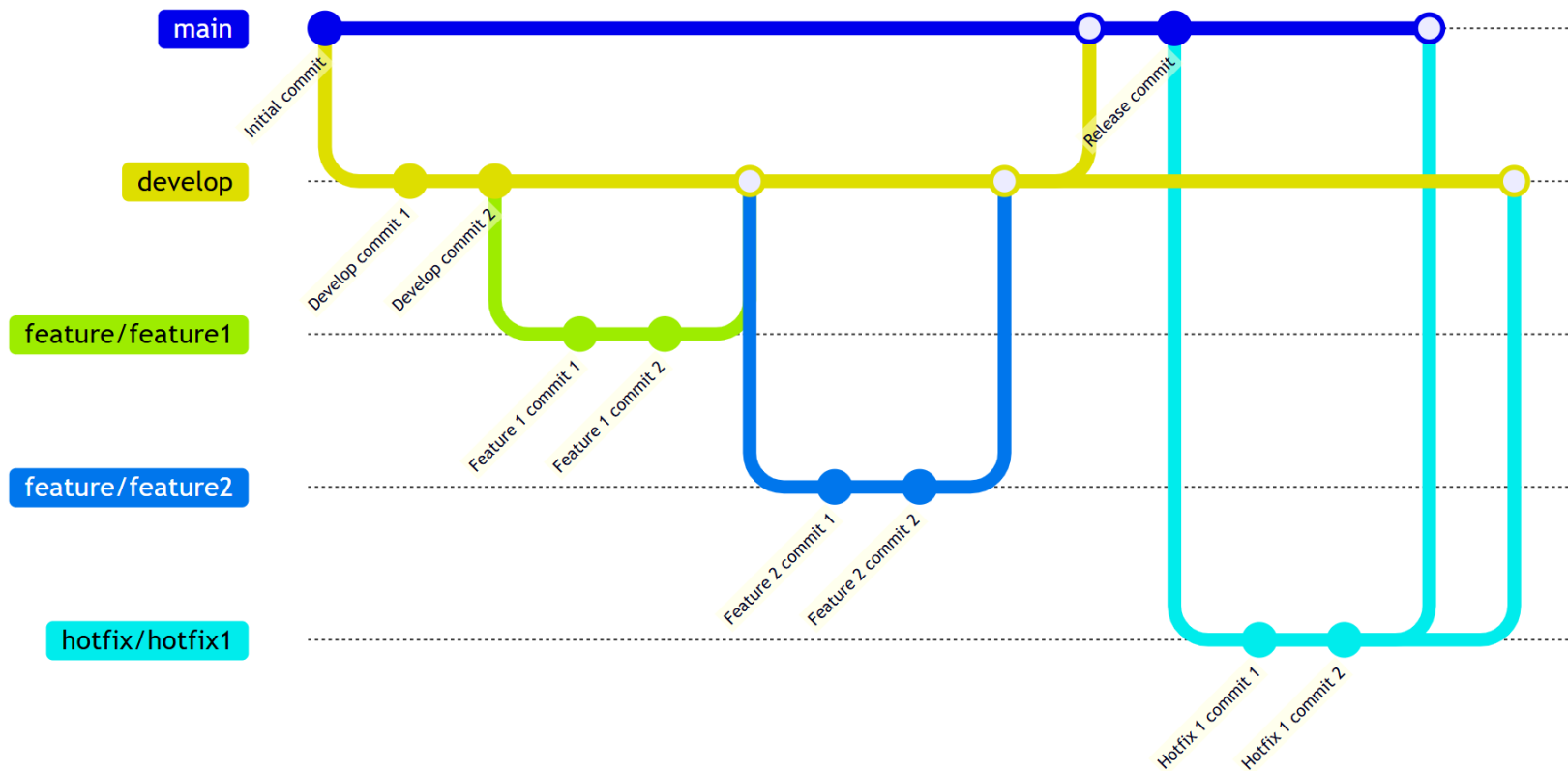


Dlaczego warto używać Gita?

- Bezpieczne przechowywanie kodu
- Łatwa współpraca w zespole
- Kontrola nad historią zmian
- Możliwość eksperymentowania bez ryzyka utraty danych

Gitflow

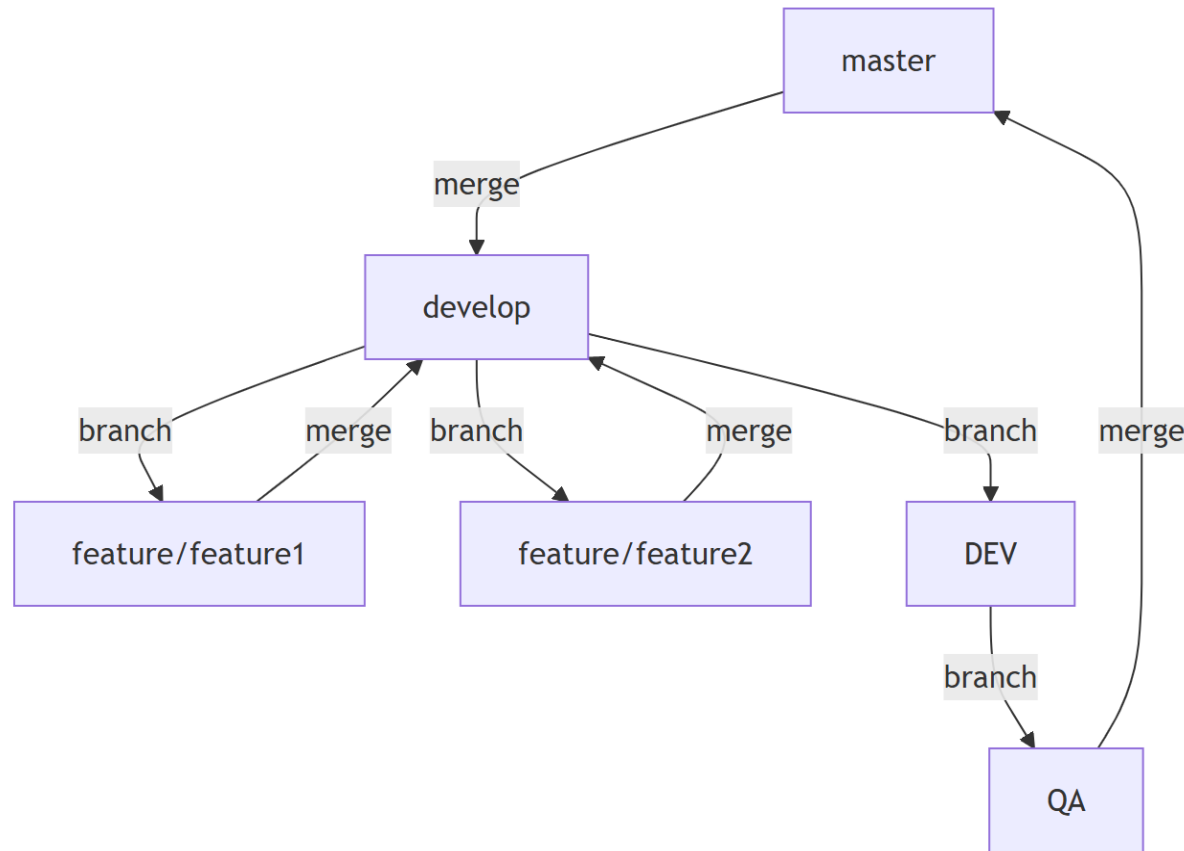
System kontroli wersji



- git flow init
- git flow feature start MYFEATURE
- git flow feature finish MYFEATURE
- git flow feature publish MYFEATURE
- git flow release start RELEASE [BASE]
- git flow release publish RELEASE
- git flow release finish RELEASE

Dodatkowe gałęzie

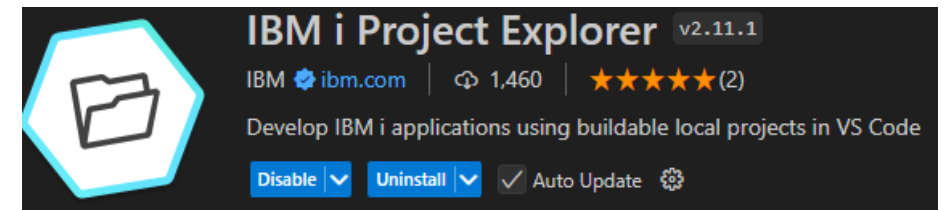
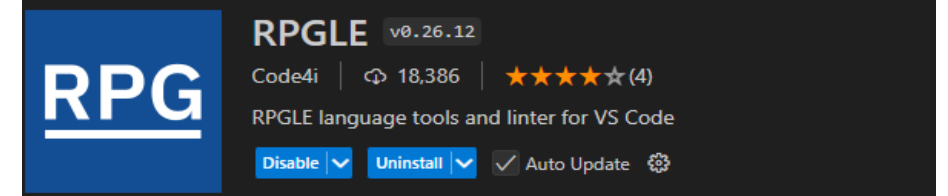
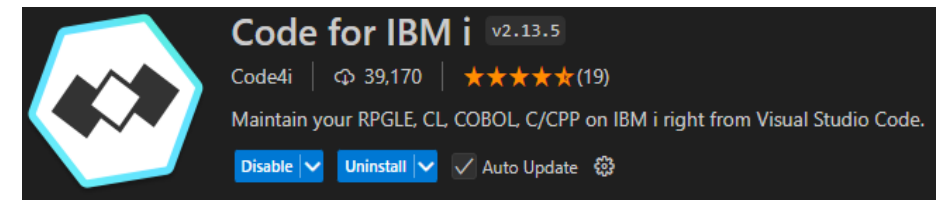
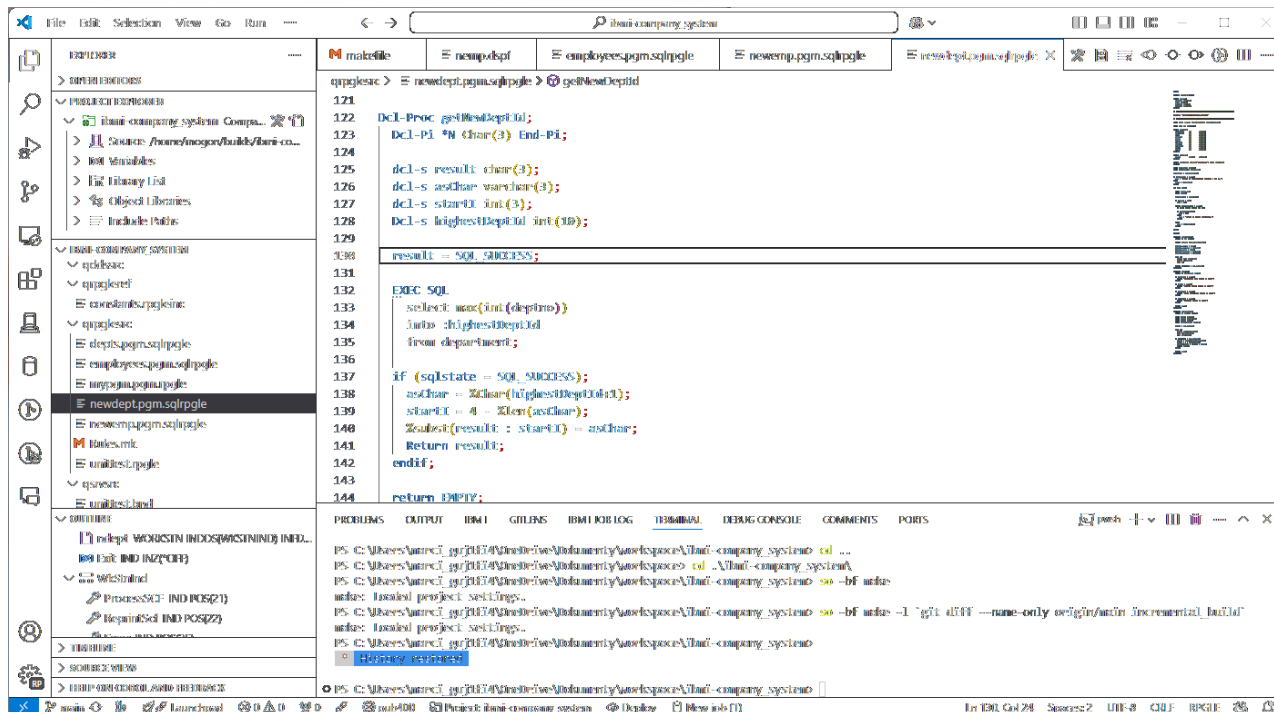
System kontroli wersji



- **master**: Główna gałąź gotowa do produkcji.
- **develop**: Gałąź integracyjna, gdzie wszystkie gałęzie funkcji są scalane.
- **feature/feature1** i **feature/feature2**: Przykładowe gałęzie funkcji, które są odgałęzione od **develop** i scalane z powrotem do **develop** po zakończeniu.
- **DEV**: Gałąź utworzona z **develop** do testowania w środowisku deweloperskim.
- **QA**: Gałąź utworzona z **DEV** do testowania jakości przed scaleniem do **master**.

Visual Studio Code i dodatki IBM i

Środowisko programistyczne



Budowanie i wdrażanie (Deploy)

Środowisko programistyczne

Lokalizacja wdrażania:

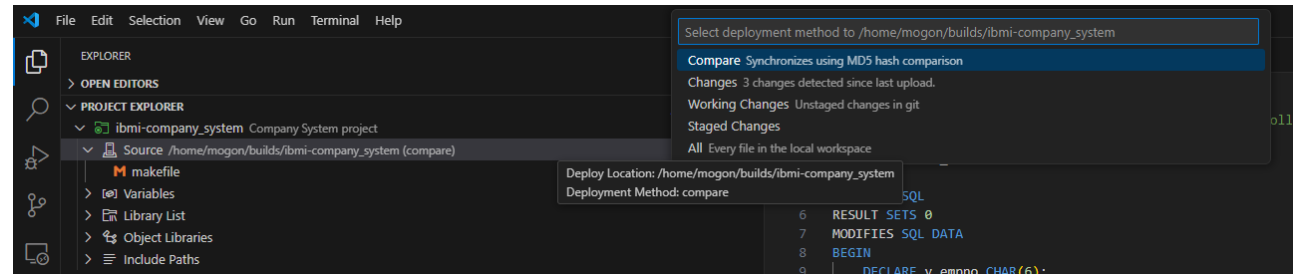
- Ustawiana tylko raz
- Źródła są przesyłane i kompilowane
- Deweloper otrzymuje unikalną lokalizację
- Każde repozytorium ma unikalną lokalizację

Wdrażanie (Deploy):

- Różne sposoby przenoszenia plików do lokalizacji wdrażania
- Zazwyczaj "Compare" jest metodą najbezpieczniejszą

Akcje:

- Definicje w pliku .vscode/actions.json trzymane w repozytorium
- Domyślnie zestaw uniwersalnych komend używanych przez większość
- Programista wybiera opcję do uruchomienia
- Komendy wykonywane są na serwerze



Analiza statyczna i testy jednostkowe

Testowanie

IRPGUnit

Wykonuje zestawy testów iRPGUnit z RDi

Wyświetla raporty oraz wyniki testów jednostkowych w widoku.

Budowanie i uruchamianie:

- CRTRPGMOD
- CRTSRVPGM
- RUCALLTST
 - XMLSTMF('./test/TEST-report.xml')

VSCODE-RPGLE

Asystent treści, sprawdzanie wcięć i ponowne formatowanie (tylko **FREE).

Pomoc kolumnowa dla RPGLE o stałym formacie.

Konfiguracja:

- .vscode/rpglint.json

Uruchamianie:

- `npx @halcyontech/rpglint`

RPGLINT

Testowanie

Directives must be in the specified case. (`lower` or `upper`)

Deprecated use `DirectivesCase` instead. Directives must be in uppercase.

JOINS in Embedded SQL are not allowed.

Globals are not allowed in procedures.

Specific casing for op codes, declarations or built-in functions codes.

CTDATA is not allowed.

Comments cannot be blank, must start with a space and have correct indentation.

Global subroutines are not allowed.

Subroutines in procedures are not allowed.

Unreferenced definitions are not allowed.

Calls to certain APIs are not allowed. (EXTPROC / EXTPGM)

Embedded SQL statement with EXECUTE IMMEDIATE not allowed.

Declaring a prototype with EXTPGM and EXTPROC using a procedure is now allowed.

When using copy or include statements, path must be relative to the root. Usage is only recommended for local/workspace projects.

Warns when referencing variables in Embedded SQL that are also defined locally.

Requires `SELECT` blocks to have an `OTHER` block.

Struct names cannot be blank (*N).

Struct names must be qualified (QUALIFIED).

Prototypes can only be defined with either EXT, EXTPGM or EXTPROC

Expressions must be surrounded by brackets.

OCCURS is not allowed.

'SELECT *' is not allowed in Embedded SQL.

Redundant operation codes (EVAL, CALLP) not allowed.

Constants must be in uppercase.

Variable names must match the case of the definition.

Parentheses must be used on a procedure call, even if it has no parameters.

Procedure titles and descriptions must be provided.

Duplicate string literals are not allowed.

*BLANK must be used over empty string literals.

Force which directive which must be used to include other source. (`COPY` or `INCLUDE`)

<https://codefori.github.io/docs/extensions/rpgle/linter/>

Narzędzia

Budowanie

- **GNU Make**

- Budowa projektu: /QOpenSys/pkgs/bin/gmake
- Kompilacja plików: /QOpenSys/pkgs/bin/gmake {pliki}

- **ibmi-bob**

- Budowa projektu: makei build
- Kompilacja plików: makei compile -f {pliki}

- **ARCAD Builder from IBM i Modernization Engine for Lifecycle Integration (Merlin)**

- Budowa projektu: /QOpenSys/pkgs/bin/elias compile {branch}
- Kompilacja plików: /QOpenSys/pkgs/bin/elias compile {branch} -f {pliki}

Source Orbit

Zarządzanie zależnościami w projektach systemu IBM i

Zalety:

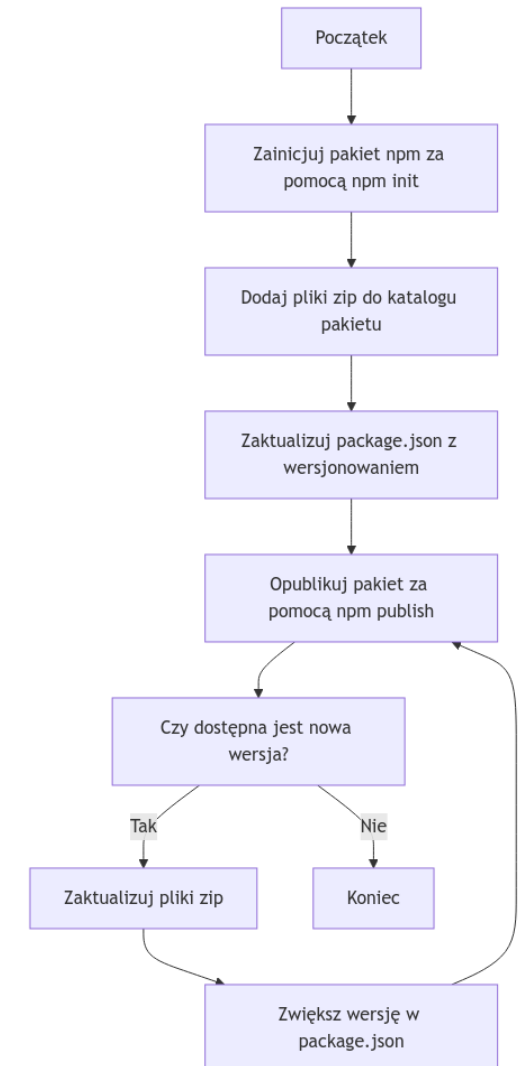
- Komendy wiersza poleceń, CLI
- Tworzy listy zależności dla RPGLE, DDS, SQL, CL itp.
- Generuje informacje dotyczące analizy wpływu
- Tworzy skrypty, automatyzujące kompilację kodu aplikacji
- Czyści repozytorium

Wady: ?

Pakowanie

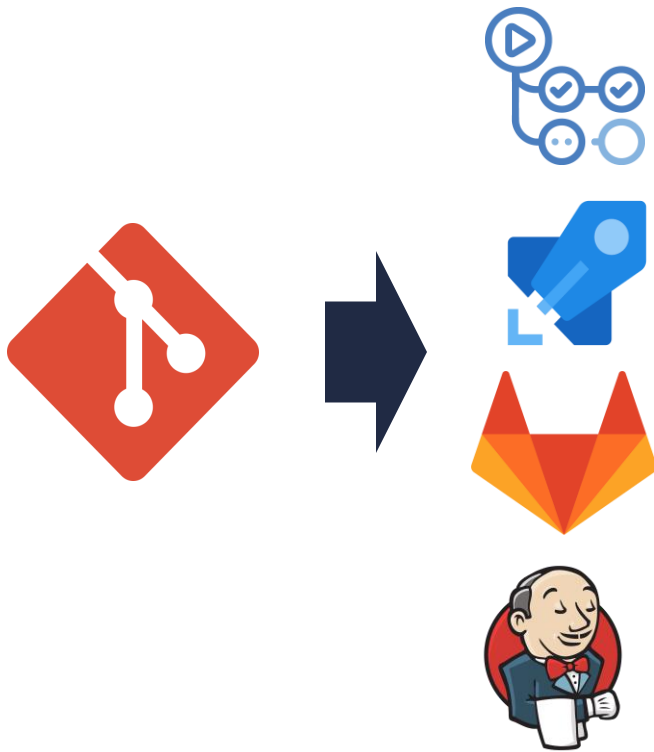
Budowanie

- **GitHub/Azure Pipelines**
 - artefakty przepływu pracy
- **npm– Manager pakietów dla środowiska Node.js**
 - package.json
- **Komenda JAR służy do tworzenia, aktualizowania, wyodrębniania i przeglądania plików Java Archive (JAR).**
 - Tworzenie archiwum: `jar cfv`
 - Wypakowanie archiwum: `jar xf`

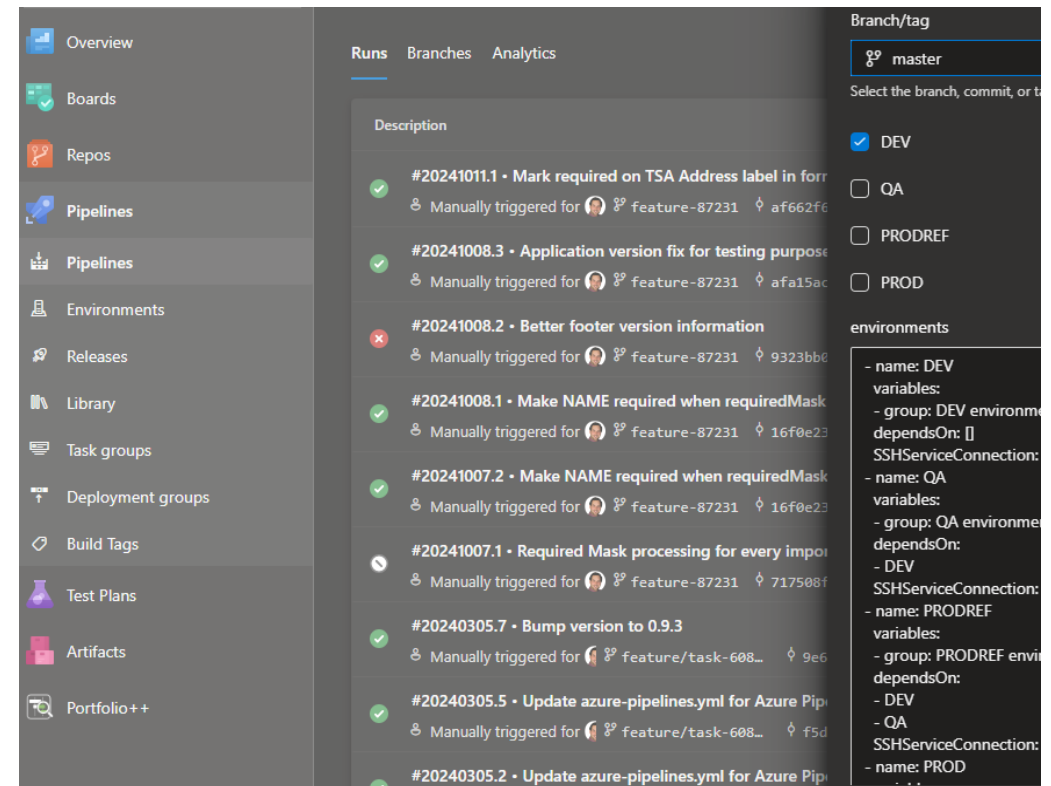


Platformy

Automatyzacja



GitHub Actions	cokolwiek.yaml
Azure DevOps	azure-pipeline.yaml
GitLab	.gitlab-ci.yml
Jenkins	Jenkinsfile



GitHub deploy i pull request actions

Automatyzacja

```

name: Verify and build project
on:
  push:
    branches:
      - main
jobs:
  ibmi-build:
    environment: COMMON1
    runs-on: ubuntu-latest
    permissions:
      packages: read
      contents: read
    steps:
      - uses: actions/checkout@v4
        with:
          fetch-depth: 0
      - uses: actions/setup-node@v4
        with:
          node-version: 20
      - run: npm i -g @ibm/sourceorbit @ibm/ibmi-ci @halcyontech/rpglint
      - name: Generate lint information
        continue-on-error: true
        run: rpglint >> $GITHUB_STEP_SUMMARY
      - name: Generate makefile
        run: so -bf make

```

```

- name: Generate impact information
  run: so -bf imd -l `git diff --name-only origin/main origin/${GITHUB_HEAD_REF}`
- name: Adding markdown
  run: cat impact.md >> $GITHUB_STEP_SUMMARY
- name: Post comment
  uses: actions/github-script@v5
  with:
    script: |
      github.rest.issues.createComment({
        issue_number: context.issue.number,
        owner: context.repo.owner,
        repo: context.repo.repo,
        body: '🍌 A new change report is available based on this PR being created.\n\n[See summary here.](https://github.com/' + context.repo.owner + '/' + context.repo.repo + '/actions/runs/${{ github.run_id }})'
      })
- name: Generate makefile
  run: so -bf make -l `git diff --name-only origin/main origin/${GITHUB_HEAD_REF}`
- name: Deploy to IBM i
  run: |
    ici \
      --cmd "mkdir -p './builds/ics_${GITHUB_HEAD_REF}'" \
      --rcwd "./builds/ics_${GITHUB_HEAD_REF}" \
      --push "." \
      --cmd "/QOpenSys/pkgs/bin/gmake LIBL='${{ vars.IBMI_LIB }}' ${{ vars.IBMI_RPGUNIT_LIB }}' BIN_LIB='${{ vars.IBMI_BRANCH_LIB }}' \
      --ignore --cmd "/QOpenSys/pkgs/bin/gmake -f test/makefile BIN_LIB='${{ vars.IBMI_BRANCH_LIB }}' RPGUNIT_LIB='${{ vars.IBMI_RPGUNIT_LIB }}' \
      --ignore --get "/test/TEST-report.xml" "/test/TEST-report.xml"
  env:
    IBMI_HOST: ${{ secrets.IBMI_HOST }}
    IBMI_USER: ${{ secrets.IBMI_USER }}
    IBMI_PASSWORD: ${{ secrets.IBMI_PASSWORD }}
    IBMI_SSH_PORT: ${{ secrets.IBMI_SSH_PORT }}

```

Raport wykonania akcji

Automatyzacja

Summary

Jobs

so-impact

Run details

Usage

Workflow file

so-impact summary

Linting 6 files.

Impact Analysis

Touched objects:

MYPGM.PGM : qrpglesrc/mypgm.pgm.rpgle

MYPGM.PGM

Click to expand

Messages

qrpglesrc/mypgm.pgm.rpgle

Include at line 4 found, to path 'qrpgleref/constants.rpgleinc'

Project Listing

Click to expand

	Tests	Passed	Skipped	Failed
JUnit Test Report	0 ran	0 passed	0 skipped	0 failed

Job summary generated at run-time

-	Object	Type	Path	Warnings	Parents	Children
	XDEPT3	FILE	qddssrc/department_admrdept.index		0	▶ 1
	XDEPT1	FILE	qddssrc/department_deptno.index		0	▶ 1
	XDEPT2	FILE	qddssrc/department_mgrno.index		0	▶ 1
	DEPARTMENT	FILE	qddssrc/department.table	▶	▶ 6	0
	DEPTS	FILE	qddssrc/depts.dspf		▼ 1 DEPTS.PGM	0
	XEMP1	FILE	qddssrc/employee_empno.index		0	▶ 1
	XEMP2	FILE	qddssrc/employee_workdept.index		0	▶ 1
	EMPLOYEE	FILE	qddssrc/employee.table	▶	▶ 4	0
	EMPS	FILE	qddssrc/emps.dspf		▶ 1	0
	NDEPT	FILE	qddssrc/ndept.dspf		▶ 1	0
	NEMP	FILE	qddssrc/nemp.dspf		▶ 1	0
	XPAY2	FILE	qddssrc/payout_empno.index		0	▶ 1
	XPAY1	FILE	qddssrc/payout_payoutno.index		0	▶ 1
	PAYOUT	FILE	qddssrc/payout.table		▶ 3	0
	POPDEPT	PGM	qddssrc/popdept.sqlprc		0	▶ 1
	POPEMP	PGM	qddssrc/popemp.sqlprc		0	0
	PROCPAY	PGM	qddssrc/procpay.sqlprc		0	▶ 1
	DEPTS	PGM	qrpglesrc/depts.pgm.sqlrpgle	▶	0	▶ 4
	EMPLOYEES	PGM	qrpglesrc/employees.pgm.sqlrpgle	▶	▶ 1	▶ 2

Log wykonania akcji

Automatyzacja

so-impact
succeeded 5 days ago in 39s

> Set up job

> Run actions/checkout@v4

> Run actions/setup-node@v4

> Run npm i -g @ibm/sourceorbit

> Run npm i -g @ibm/ibmi-ci

> Run npm i -g @halcyontech/rpglint

> Generate lint information

> Generate impact information

> Adding markdown

> Post comment

> Generate makefile

> Deploy to IBM i

> Publish Test Report

> Post Run actions/setup-node@v4

> Post Run actions/checkout@v4

> Complete job

2s

1s

0s

1s

6s

1s

0s

0s

0s

1s

0s

21s

0s

0s

0s

0s

Deploy to IBM i 21s

```
92 =====
93 Executing step 6: cmd
94 =====
95
96 /home/MOGON/builds/ics_incremental_build $ /QOpenSys/pkgs/bin/gmake LIBL='MOGON1 MOGONB' BIN_LIB=MOGON2
97 system -q "CRTLIB LIB(MOGON2)"
98 gmake: [makefile:33: library] Error 1 (ignored)
99 liblist -c MOGON2;\
100 liblist -a MOGON1 MOGONB;\
101 system "CRTBNDRPG PGM(MOGON2/MYPGM) SRCSTMF('qrpglesrc/mypgm.pgm.rpgle') OPTION(*EVENTF) DBGVIEW(*SOURCE) TGTRLS(*CURRENT)
102 TGTCCSID(*JOB) BNDDIR((MOGON2/APP)) DFTACTGRP(*NO)" > .logs/mypgm.sp1f || \
103 (system "CPYTOSTMF FROMMBR('/QSYS.LIB/MOGON2.LIB/EVFEVENT.FILE/MYPGM.MBR') TOSTMF('.evfevent/mypgm.evfevent') DBFCCSID(*FILE)
104 STMFCCSID(1208) STMFOP(*REPLACE)"; /QOpenSys/usr/bin/qsh -c 'exit 1')
105 CPC7301: File EVFEVENT created in library MOGON2.
106 CPC7305: Member MYPGM added to file EVFEVENT in MOGON2.
107 RNS9304: Program MYPGM placed in library MOGON2. 00 highest severity. Created on 10/15/24 at 19:20:54.
108 CPC0904: Data area RETURNCODE created in library QTEMP.
109
110 =====
111 Executing step 7: cmd
112 =====
113 /home/MOGON/builds/ics_incremental_build $ /QOpenSys/pkgs/bin/gmake -f test/makefile BIN_LIB=MOGON2 RPGUNIT_LIB=MOGONB
114 liblist -c MOGON2;\
115 liblist -a MOGON2 MOGONB;\
116 system "RUCALLTST TSTPGM(MOGON2/UNITTEST) XMLSTMF('./test/TEST-report.xml')"
117 CPF9801: Object UNITTEST in library MOGON2 not found.
118 CPF9897: RPGUnit Error. Error while loading test suite MOGON2/UNITTEST.
119
120 *** Tests of UNITTEST ***
121 Date      : 2024-10-15 / 19:20:55
122 Job       : 842397/QUSER/QP0ZSPWT
123 User      : MOGON
124 irpUnit   : v5.0.0
125 IBM i     : V7R5M0
126 Cur. library: MOGON2
```

References

- [git-flow cheatsheet \(danielkummer.github.io\)](https://danielkummer.github.io/git-flow-cheatsheet/)
- <https://ibm.github.io/vscode-ibmi-projectexplorer/#/>
- <https://github.com/tools-400/irpgunit>
- <https://codefori.github.io/docs/>
- <https://github.com/IBM/sourceorbit>
- <https://github.com/codefori/vscode-rpgle>
- <https://github.com/codefori/vscode-ibmi>
- https://github.com/marcin-ogon/ibmi-company_system

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