

**未来志向の開発：
IBM iの可能性を最大限に引き出す
最新ツールの活用**



Charles Guarino
Central Park Data Systems, Inc.

本日お話しする内容 …

- ・ **ご挨拶と会社の説明**

- ・ **IBM i モダナイゼーション 101**

- ・ **実際のケーススタディ**

- ・ **AI と IBM i**

- ・ **まとめ**

Charles Guarinoは、IBM Power Systemsの「力」を信じています。彼のキャリアは、プラットフォームとそのソリューションを他者に提供することへの献身と関心を反映しており、その結果、IBM Championとして認識されています。

2020年の春、Charlesは毎月のバーチャルコミュニティ“IBMi iChime”を立ち上げました。各会議では、業界のエキスパートと「No PowerPoint」なディスカッションを行います。詳しくは、www.ichime.io をご覧ください。また、以前のミーティングのポッドキャストをお気に入りのポッドキャストプラットフォームで聴くことができます。

また、CharlesはTech Channelと協力し、幅広いトピックを扱うIT業界関連のポッドキャストを毎月リリースしています。お聞きになりたい方は、

<https://techchannel.com/Authors/charles-guarino>

現在、セントラルパークデータシステムズのチームとともに、コンサルティング業務や受賞歴のある講演活動を通じて、世界中の個人や企業にサービスを提供しています。

Charles連絡先はこちら cguarino@centralparkdata.com.

LinkedIn - <http://www.linkedin.com/in/guarinocharles>

Twitter - @charlieguarino



Author

Charlie Guarino



Charlie Guarino is the president of Central Park Data Systems.

A note from Charlie:

"When I was young, I always enjoyed the stories my grandparents told me about when they grew up in Sicily. It seemed like such a magical place. Through a lot of research, planning and a bit of luck, many years later I was finally able to walk up and down the same street where my grandparents lived when they were children. A day in my life I will never forget!"

Charlie is pictured above, on that street in Sicily.

<https://techchannel.com/Authors/charles-guarino>

Central Park Data Systems

会社概要



創立 1995年

会社の使命

まず第一に、IBM iをSystem of Recordとして使用するお客様との信頼関係を築き、価格の問題よりも優先して最高品質のITサービスを提供すること。

SWOT分析に忠実であり、いかなる場合にもお客様のニーズと予算を尊重すること。

ビジネスパートナーとの戦略的関係を維持し、当社の提供するサービスの範囲と専門性を拡大すること。

専門分野とサービス

RPG プログラミング (レガシーからフリーフォームまで)

SQL プログラミング

データベース・デザイン

アプリケーション・モダナイゼーション

プロジェクト管理

充実したEDI

WebサービスとAPI

アプリケーション開発研修

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ご注意ください！



IBM | Documentation | Search IBM Documentation

ソフトウェアの営業活動終了およびサポート終了: IBM i Modernization Engine for Lifecycle Integration (Merlin) 1.0.0、IBM Rational Developer for i 9.6、および IBM i ポートフォリオのその他の一部の機能

発行済み: 7 May 2024 AD24-0477 Withdrawal

サポート終了

<https://www.ibm.com/docs/en/announcements/end-marketing-end-support-i-merlin-10-rdi-96-selected-i-functions>

ご注意ください！

IBM Rational Development Studio for i Application Development Toolset is withdrawing selected tools:

- Report Layout Utility (RLU)
- Screen Design Aid (SDA)
- File Compare and Merge Utility (FCMU)
- Advanced Printer Function (APF)
- Character Generator Utility (CGU)
- Data File Utility (DFU)

IBM i 7.5,
7.4, 7.3,
7.2

Rational Development Studio for i (5770-WDS) option 21

There are several options for replacement, including Rational Developer for i, Code for i, and others.

Rational Developer for IBM i

The screenshot displays the Rational Developer for IBM i interface. The main window shows a code editor for a file named ZCONTTRG2.SQLRPGL. The code is written in SQLRPGLE and includes several declarations and a procedure definition. The Outline window on the right lists the contents of the file, including control statements, global definitions, and subprocedures.

```
Line 1210 Column 17 Replace
.....1.....2.....3.....4.....5.....6.....+
118100 // *****
118200 //           I n s e r t   C o n t a c t   T i e r
118300 // *****
118400 Dcl-Proc InsertCRTCONT;
118500     Dcl-Pi InsertCRTCONT varchar(128);
118600     End-Pi;
118700
118800     Dcl-s  error varchar(128);
118900     Dcl-s  AddCont Ind;
119000     Dcl-s  AddRshp Ind;
119100
119200     // First check to make sure the contact key supplied is
119300     // if so, return error.
119400
119500     If N_c3ckey = *zeros;
119600         error =
119700         'The supplied contact key is zero and is invalid. Is
119800         t the next available contact key';
119900         return error;
(InserCRTCONT)
```

The Outline window on the right shows the following structure:

- Control Statements
- Global Definitions
 - Files
 - Data Structures
 - Fields
 - Constants
 - Indicators
 - Prototypes
- Main Procedure
 - Parameters
 - Subroutines
- Subprocedures
 - getNextContKey : ZONED(18: 0)
 - InsertCRTCONT : VARCHAR(128: 2)
 - UpdateUPDCONT : VARCHAR(128: 2)
 - DeleteDLTCONT : VARCHAR(128: 2)
 - InsertCRTPHONE : VARCHAR(128: 2)
 - UpdateUPDPHONE : VARCHAR(128: 2)
 - DeleteDLTPHONE : VARCHAR(128: 2)
 - InsertCRTEMAIL : VARCHAR(128: 2)
 - UpdateUPDEMAIL : VARCHAR(128: 2)
 - DeleteDLTEMAIL : VARCHAR(128: 2)
 - InsertCRTATTR : VARCHAR(128: 2)
 - UpdateUPDATTR : VARCHAR(128: 2)
 - DeleteDLTATTR : VARCHAR(128: 2)
 - InsertCRTEVENT : VARCHAR(128: 2)

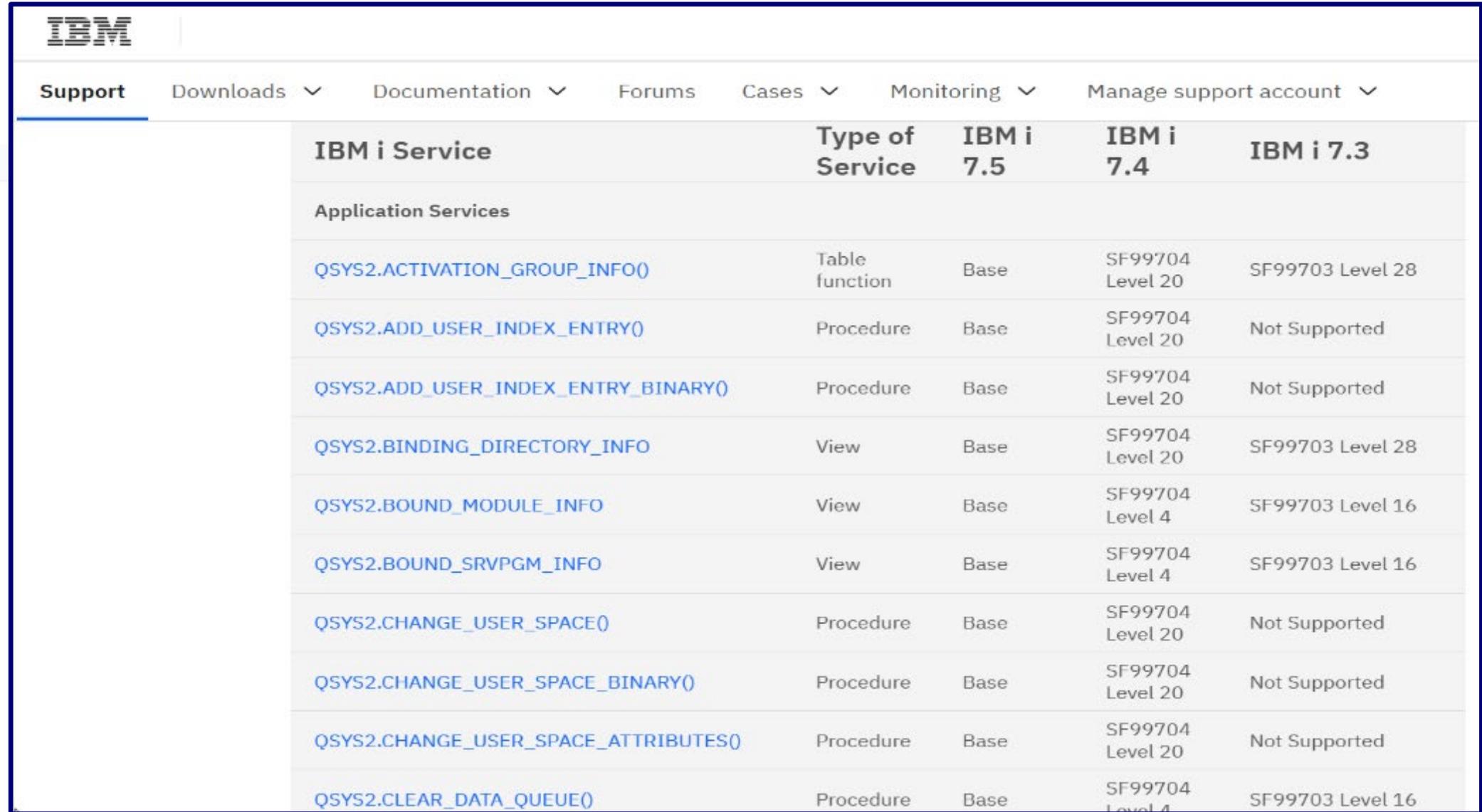
VS Code for IBM i

The screenshot displays the Visual Studio Code (VS Code) interface for IBM i development. The interface is divided into three main sections:

- Left Panel (Object Browser):** Shows the project structure under 'IBM I'. The 'OBJECT BROWSER' is expanded to show 'RDIVSCODE1 object...' and 'qrpglesrc'. The file 'zcontttrg2.sql...' is selected.
- Central Editor:** Displays the source code for 'ZCONTTTRG2.SQLRPGLE > InsertCRTCONT'. The code is in COBOL and includes the following snippets:

```
// *****  
//          I n s e r t   C o n t a c t  
// *****  
Dcl-Proc InsertCRTCONT;  
  Dcl-Pi InsertCRTCONT varchar(128);  
  End-Pi;  
  
  Dcl-s  error varchar(128);  
  Dcl-s  AddCont Ind;  
  Dcl-s  AddRshp Ind;  
  
  // First check to make sure the contact key sup  
  // if so, return error.  
  
  If N_c3ckey = *zeros;  
    error =  
    'The supplied contact key is zero and is inva  
    | t the next available contact key';  
    return error;  
  Endif;  
  
  // Check if contact file has record already if
```
- Right Panel (Project Tree):** Shows a tree view of the project structure, including subroutines like '*inzsr Subroutine', '*N', 'CancelCANBKO', 'CancelCANORD', 'CreateCRTREG', and 'DeleteAttrTier'.

SQL サービス



IBM i Service	Type of Service	IBM i 7.5	IBM i 7.4	IBM i 7.3
Application Services				
QSYS2.ACTIVATION_GROUP_INFO()	Table function	Base	SF99704 Level 20	SF99703 Level 28
QSYS2.ADD_USER_INDEX_ENTRY()	Procedure	Base	SF99704 Level 20	Not Supported
QSYS2.ADD_USER_INDEX_ENTRY_BINARY()	Procedure	Base	SF99704 Level 20	Not Supported
QSYS2.BINDING_DIRECTORY_INFO	View	Base	SF99704 Level 20	SF99703 Level 28
QSYS2.BOUND_MODULE_INFO	View	Base	SF99704 Level 4	SF99703 Level 16
QSYS2.BOUND_SRPVPGM_INFO	View	Base	SF99704 Level 4	SF99703 Level 16
QSYS2.CHANGE_USER_SPACE()	Procedure	Base	SF99704 Level 20	Not Supported
QSYS2.CHANGE_USER_SPACE_BINARY()	Procedure	Base	SF99704 Level 20	Not Supported
QSYS2.CHANGE_USER_SPACE_ATTRIBUTES()	Procedure	Base	SF99704 Level 20	Not Supported
QSYS2.CLEAR_DATA_QUEUE()	Procedure	Base	SF99704 Level 4	SF99703 Level 16

<https://www.ibm.com/support/pages/ibm-i-services-sql>

The screenshot shows the IBM Support website's 'RPG Cafe' page. At the top, the IBM logo is on the left, and a navigation menu includes 'Support' (underlined), 'Downloads', 'Documentation', 'Forums', 'Cases', 'Monitoring', and 'Manage support account'. Below the navigation is a dark header with 'IBM Support' in large white text and a search bar with the placeholder 'Search support or find a product'. The main content area is white and features the heading 'RPG Cafe' followed by the text 'This is the RPG Cafe. Information about RPG enhancements, and other RPG-related topics.' A horizontal menu contains links for 'Announcement', 'Enhancements', 'Ideas (RFE)', 'Forum', 'How-To', 'Utilities', 'Tips', 'RDi', and 'Db2'. Below this is a large blue heading 'Welcome to the RPG Cafe' with a 'Short URL for' link to its right. Underneath is another blue heading 'Follow the the IBM community forum for RPG'. The page concludes with a section titled 'Announcement' containing a bulleted list of updates, including 'New Fall 2024: PTF enhancements for 7.5 and 7.4' with sub-points about 2-digit years, %PROC() in ON-EXIT, and new built-in functions %HIVAL and %LOVAL.

IBM |

[Support](#) [Downloads](#) [Documentation](#) [Forums](#) [Cases](#) [Monitoring](#) [Manage support account](#)

IBM Support

Search support or find a product

RPG Cafe

This is the RPG Cafe. Information about RPG enhancements, and other RPG-related topics.

[Announcement](#) [Enhancements](#) [Ideas \(RFE\)](#) [Forum](#) [How-To](#) [Utilities](#) [Tips](#) [RDi](#) [Db2](#)

Welcome to the RPG Cafe

Short URL for

Follow the [the IBM community forum for RPG](#)

Announcement

- New** Fall 2024: PTF enhancements for 7.5 and 7.4 :
 - [Find where you use 2-digit years, to avoid the "2039 problem"](#)
 - [Use %PROC\(\) in ON-EXIT](#)
 - [New built-in functions %HIVAL and %LOVAL](#)

<https://www.ibm.com/support/pages/rpg-cafe>

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- ・ IBM i モダナイゼーション 101
- ・ 実際のケーススタディ
- ・ AI と IBM i
- ・ まとめ

世界中のお客様がどのようにIBM iを使用しているかをご覧ください。

IBM i Client Stories

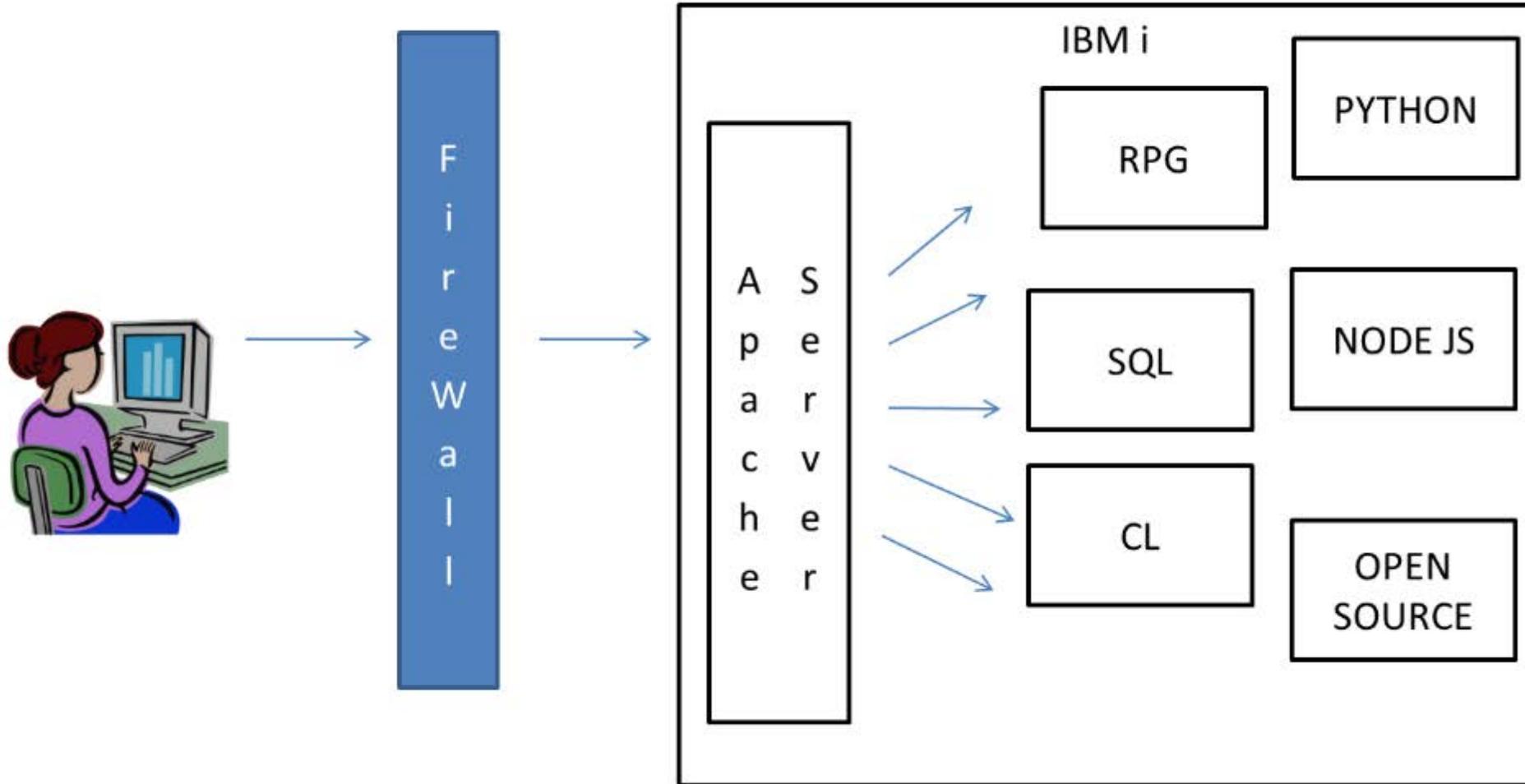
IBM i provides continuous availability, enhanced security, simplified systems management and integration with new technologies — making it the trusted platform to run businesses

<https://www.ibm.com/it-infrastructure/us-en/resources/power/ibm-i-customer-stories/>

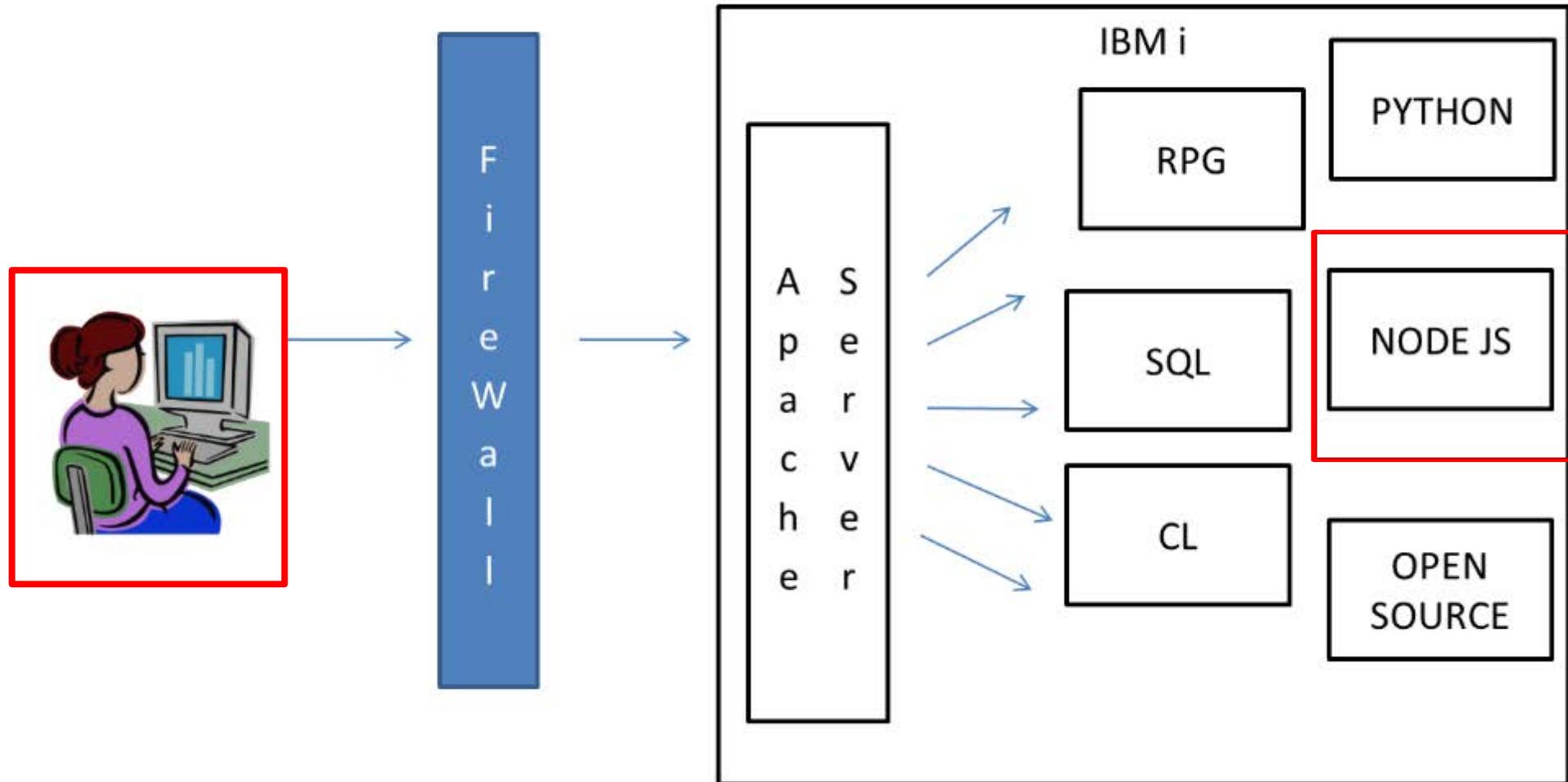
保守プログラム：もともとの黒画面

```
F Filter Name Scroll 10/30/24 16:22:15
Mode: Update Scrolling By: Filter Name
Showing Active Rcds Only
Enter Option: 2=Edit, 4=ActiveSts, 5=View, 8=Values
To search, start with a "?" and the search string
Opt  Filter Name Value Is
Rcds. Upd-Date Active
-----
5 8/05/2024 Yes
4 8/05/2024 Yes
98 8/05/2024 Yes
36 8/05/2024 Yes
49 8/05/2024 Yes
19 8/05/2024 Yes
1482 8/05/2024 Yes
4 8/05/2024 Yes
3 8/05/2024 Yes
5 8/05/2024 Yes
1 8/05/2024 Yes
98 8/05/2024 Yes
3 8/05/2024 Yes
16 8/05/2024 Yes
2 8/05/2024 Yes
More...
F6=Create F8=Show All Rcds F3=Exit
```

アプリケーション・フロー



アプリケーション・フロー – オープンソース言語である Node.js の採用



黒画面からブラウザへ

PRODUCT LIST ASSET LIST Web  

Development Environment: LP

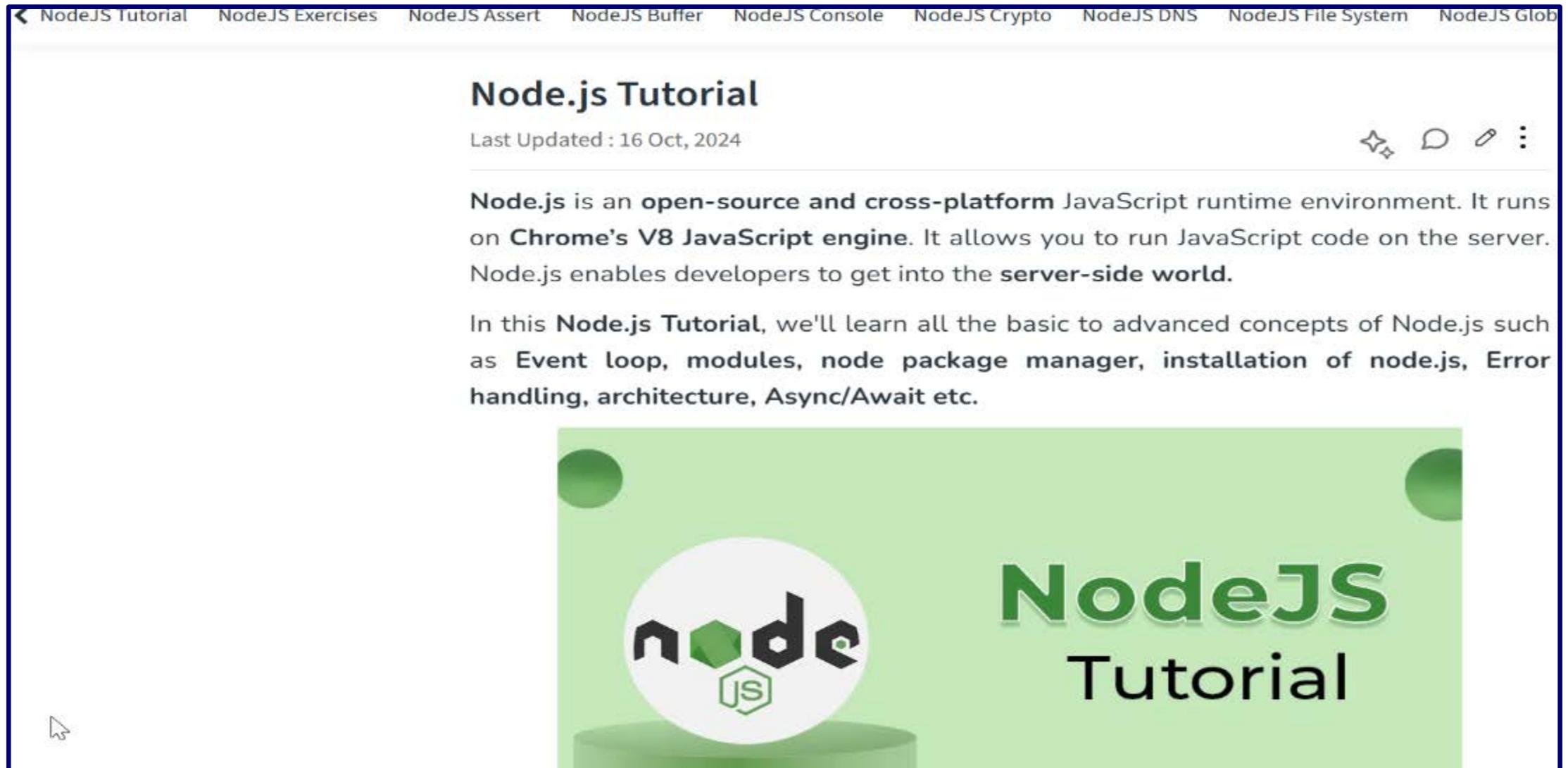
 Copy data  Import  Export

Manage Products  Exclude discontinued images  ...

SKU	Image	Discontinued	Is kit	Attribute type	Type	Post Status
<input type="checkbox"/>	<input type="text"/>	Select statuses 	Any 	Select attributes 	Select type 	Any 
		Active	N	Standalone	S	To post
		Active	N	Standalone	C	To post
		Active	N	Standalone	C	To post
		Active	N	Standalone	S	To post
		Active	N	Child	S	To post
		Active	N	Parent	S	To post
		Active	N	Parent	S	To post
		Active	N	-	-	-

« < 1 2 3 4 5 > » 1 to 10 of 32614 10 

Webには参考文献が沢山あります



The screenshot shows a web browser window with a navigation bar at the top containing links: NodeJS Tutorial, NodeJS Exercises, NodeJS Assert, NodeJS Buffer, NodeJS Console, NodeJS Crypto, NodeJS DNS, NodeJS File System, and NodeJS Glob. The main content area features the title "Node.js Tutorial" and a sub-header "Last Updated : 16 Oct, 2024". Below this is a paragraph describing Node.js as an open-source and cross-platform JavaScript runtime environment that runs on Chrome's V8 JavaScript engine. A second paragraph states that the tutorial will cover basic to advanced concepts like the Event loop, modules, node package manager, installation of node.js, Error handling, architecture, and Async/Await. At the bottom of the page is a large green banner with the Node.js logo on the left and the text "NodeJS Tutorial" on the right.

Node.js Tutorial

Last Updated : 16 Oct, 2024

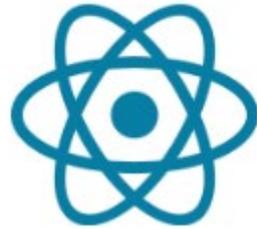
Node.js is an **open-source and cross-platform** JavaScript runtime environment. It runs on **Chrome's V8 JavaScript engine**. It allows you to run JavaScript code on the server. Node.js enables developers to get into the **server-side world**.

In this **Node.js Tutorial**, we'll learn all the basic to advanced concepts of Node.js such as **Event loop, modules, node package manager, installation of node.js, Error handling, architecture, Async/Await** etc.



<https://www.geeksforgeeks.org/nodejs/>

ユーザー・インターフェース用の React フレームワーク



React

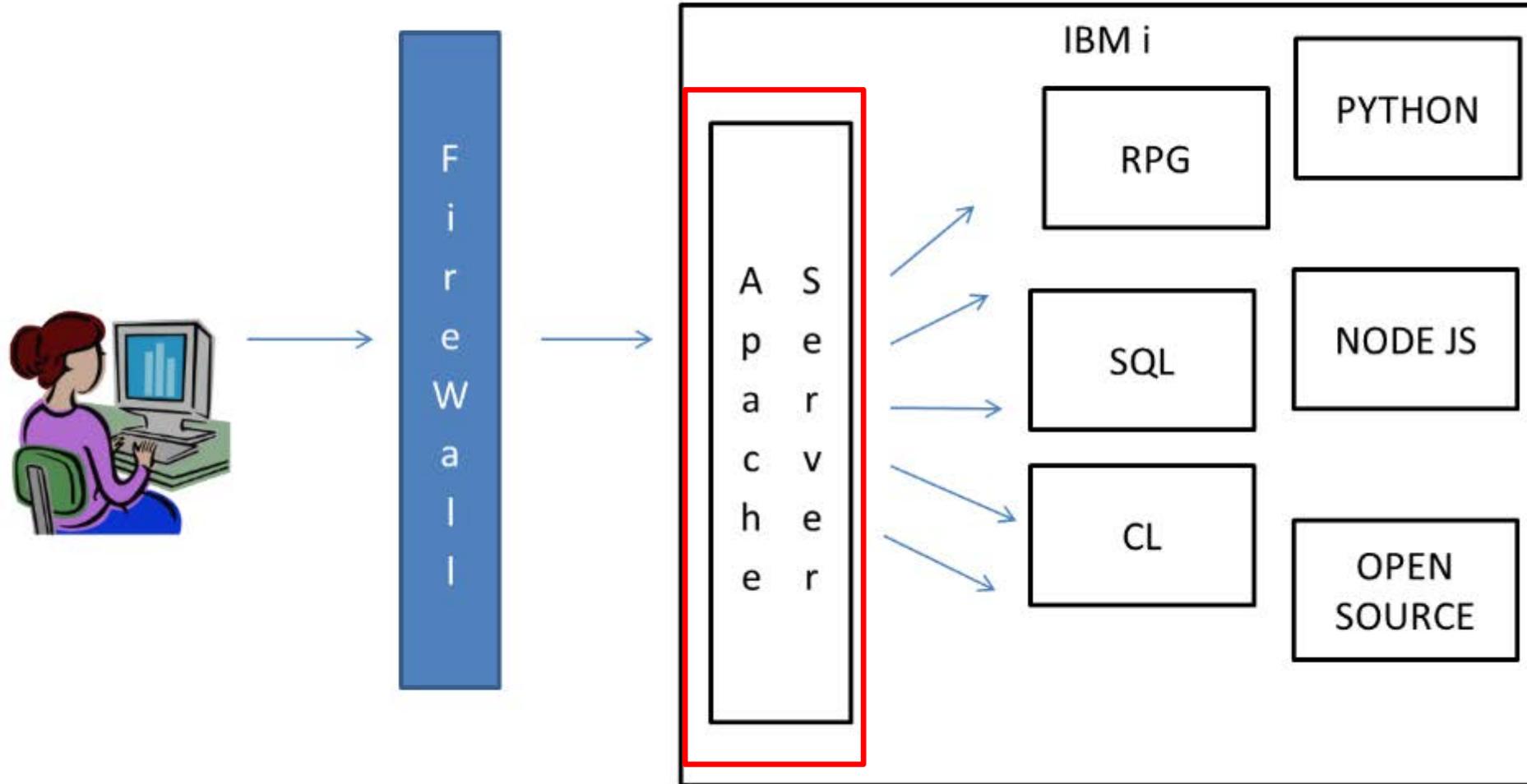
The library for web and native user interfaces

[Learn React](#)

[API Reference](#)

<https://react.dev>

アプリケーション・フロー



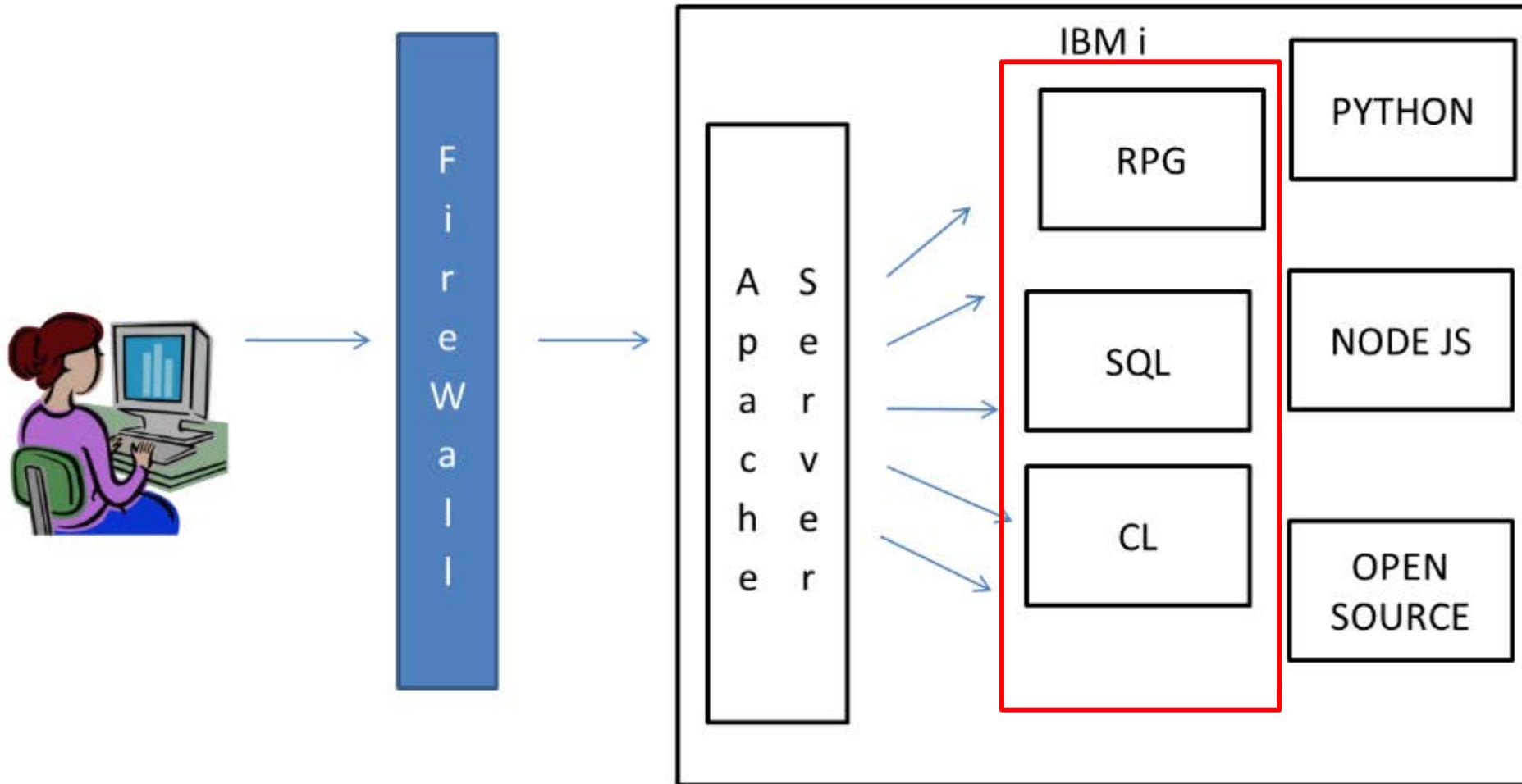
Apache サーバー

The screenshot displays the IBM Web Administration console for a user named RAINIERS. The main heading is "Manage All Servers". Below this, there are tabs for "All HTTP Servers" and "All Application Servers". A data timestamp indicates the information is current as of Oct 29, 2024 5:08:17 PM.

Server	Version	Status	Address:Port	Associated Application Server	Description
<input type="radio"/> ADMIN	Apache/2.4.53 (IBM i)	Running		None	Administration server
<input type="radio"/> AJSP	Apache/2.4.53 (IBM i)	Stopped		AJSP	
<input type="radio"/> APACHEDEF	Apache/2.4.53 (IBM i)	Stopped		None	IBM supplied sample HTTP server (powered by Apache)
<input type="radio"/> D365API	Apache/2.4.53 (IBM i)	Running		None	
<input type="radio"/> IWADEF	Apache/2.4.53 (IBM i)	Stopped		None	
<input type="radio"/> KMHTTPSRVA	Apache/2.4.53 (IBM i)	Running		None	
<input type="radio"/> PROFOUNDUI	Apache/2.4.53 (IBM i)	Stopped		None	
<input type="radio"/> PROXY	Apache/2.4.53 (IBM i)	Stopped		None	
<input type="radio"/> QIPPSVR	Apache/2.4.53 (IBM i)	Stopped		None	
<input type="radio"/> QIWIPELESS	Apache/2.4.53 (IBM i)	Stopped		None	
<input checked="" type="radio"/> WEBAPPS	Apache/2.4.53 (IBM i)	Running		None	
<input type="radio"/> WEBAPPSDEV	Apache/2.4.53 (IBM i)	Running		None	
<input type="radio"/> WEBSERVE01	Apache/2.4.53 (IBM i)	Stopped		None	Test Web Server

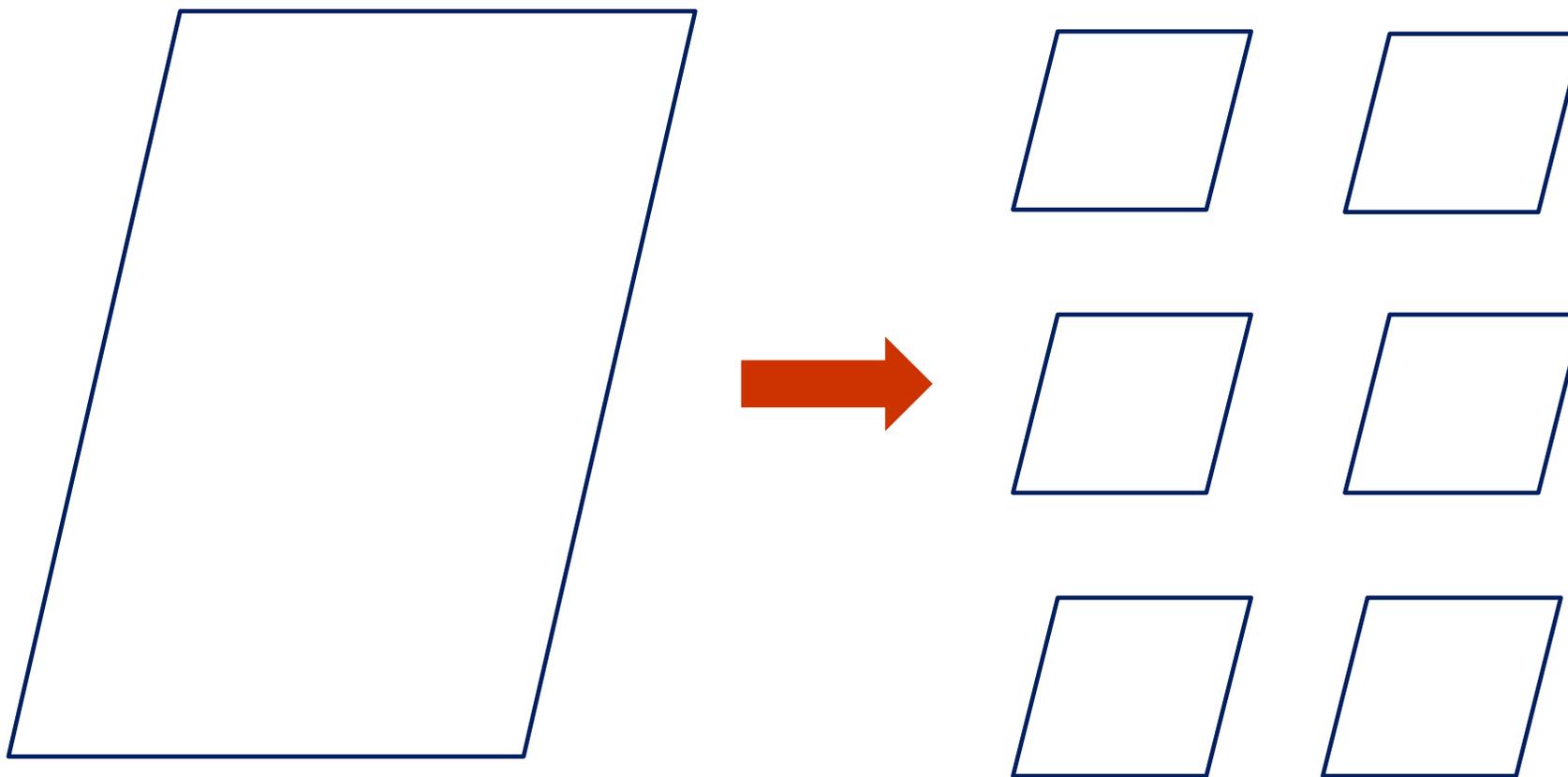
At the bottom of the table, there are control buttons: Refresh, Start, Stop, Restart, Manage Details, Delete, and Rename.

モダンな言語



モジュール性 - ビジネスロジックを外部モジュールにカプセル化する

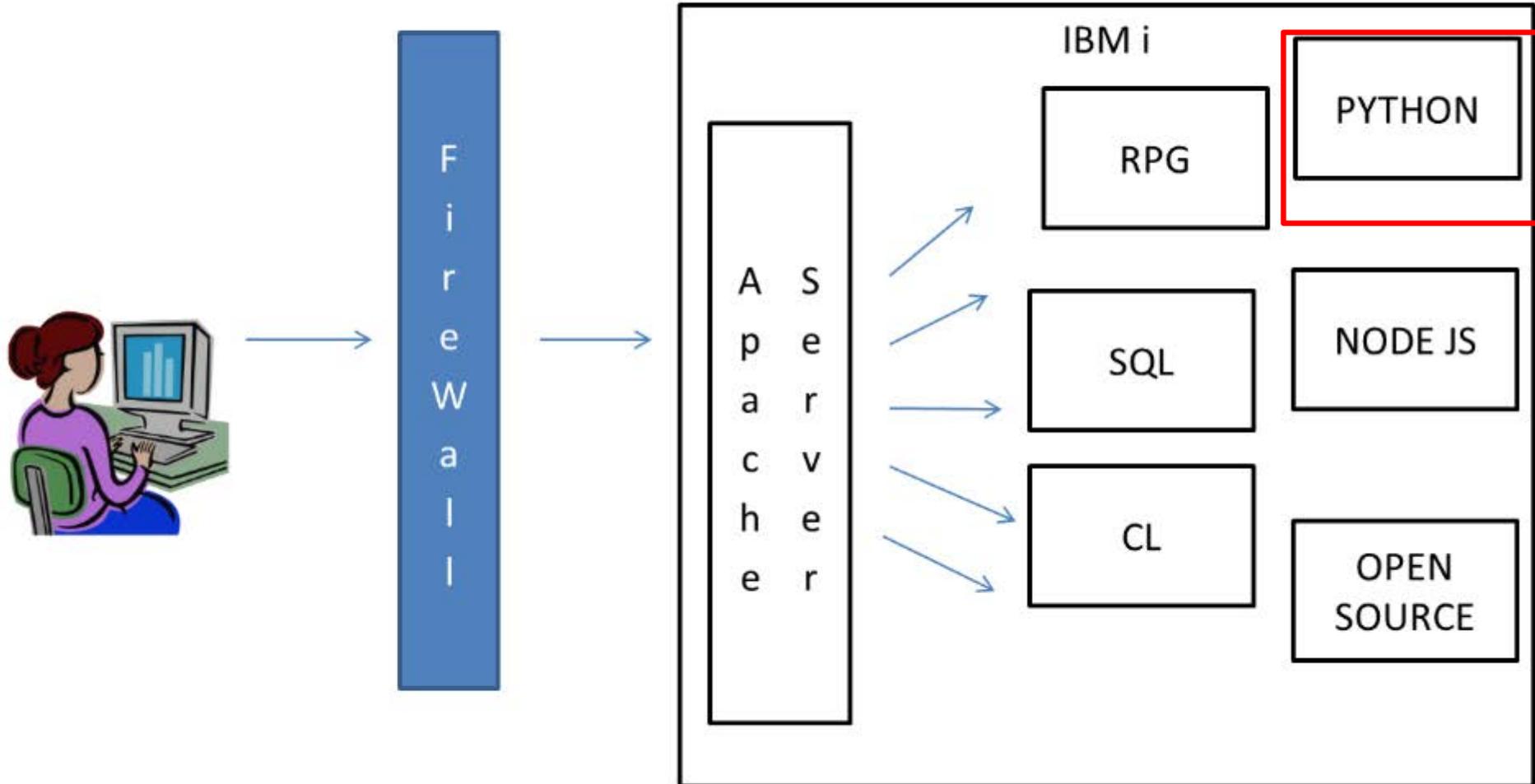
コードの冗長性を排除
"真実の1バージョン"



組み込みSQLを使用したRPG - API経由のユーザーリクエストを処理

```
Line 100      Column 1      Replace
.....1.....2.....3.....4.....5.....6.....7.....8.....9.....0
010000 ok = *on;
010100 //exec sql
010200 //select '1' into :ok from QSYS2.GROUP_PROFILE_ENTRIES
010300 //WHERE USER_PROFILE_NAME = :USER AND
010400 //GROUP_PROFILE_NAME = 'PIMUSER';
010500 if ok = *off;
010600     JSON_StartNok();
010700     yajl_addChar( 'error' : 'Error not a valid user' );
010800     JSON_Send2browser();
010900     return;
011000 endif;
011100
011200     exec sql
011300         CALL SYSPROC.WLM_SET_CLIENT_INFO(
011400             :USER,
011500             'PIM webservice',
011600             'WEBAPPS',
011700             :ENVIRONMENT,
011800             :PROGRAM );
011900
012000
012100
```

アプリケーション・フロー

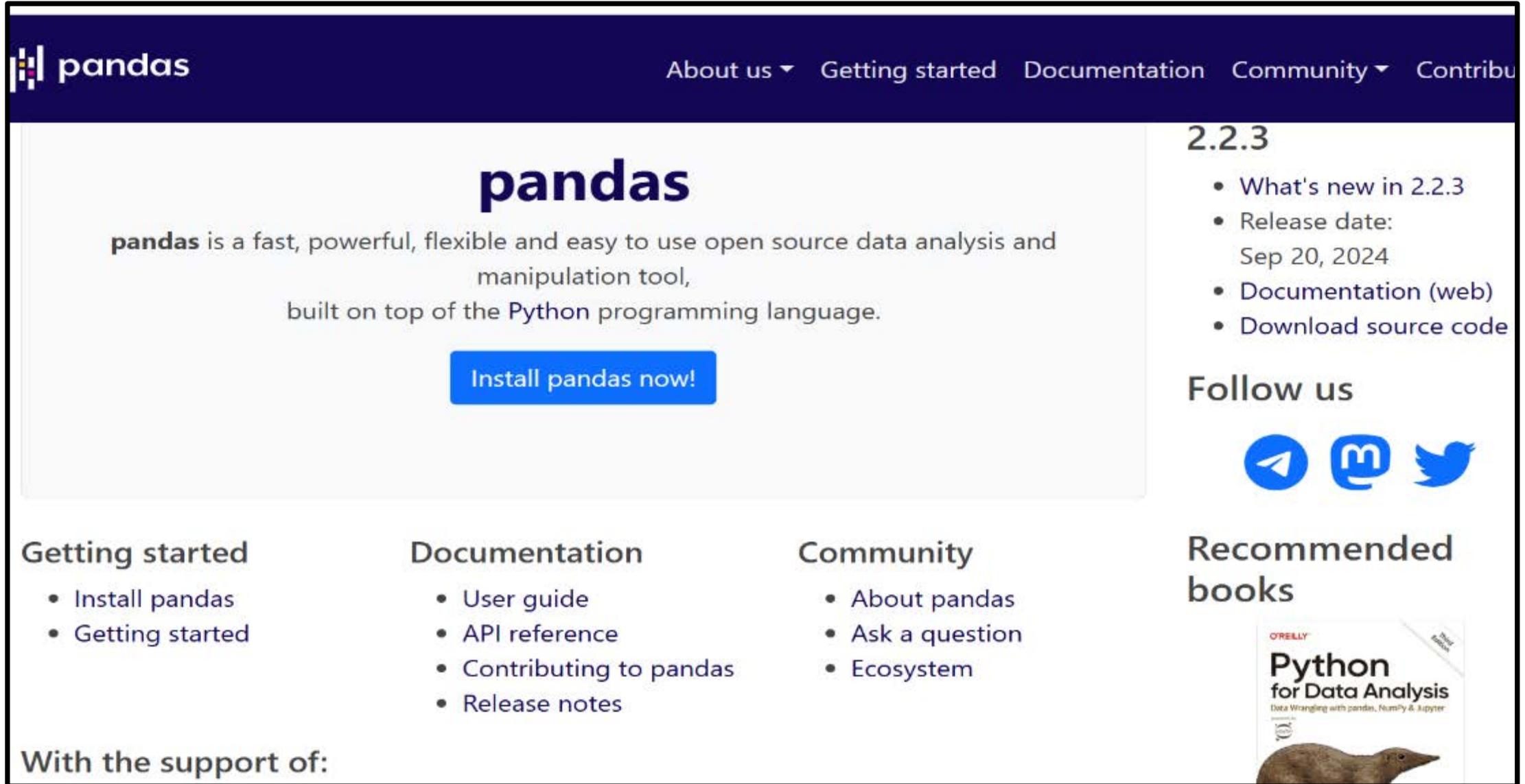


Pythonの Import / Export フィーチャー

The screenshot displays a web application interface for product management. At the top, there are tabs for 'PRODUCT LIST' and 'ASSET LIST', and a 'Web' button. A purple banner indicates the 'Development Environment: LP'. Below this, a toolbar contains 'Copy data', 'Import', and 'Export' buttons, with the latter two highlighted in a red box. The main area is titled 'Manage Products' and includes a search bar, a filter for 'Exclude discontinued', and a dropdown menu for 'images'. A table lists product details with columns for SKU, Image, Discontinued, Is kit, Attribute type, Type, and Post Status. The table contains several rows of product data, each with a small image icon and a green 'Active' status label. At the bottom, there is a pagination control showing '1 to 10 of 32614' items and a page number '10'.

SKU	Image	Discontinued	Is kit	Attribute type	Type	Post Status
		Select statuses	Any	Select attributes	Select type	Any
		Active	N	Standalone	S	To post
		Active	N	Standalone	C	To post
		Active	N	Standalone	C	To post
		Active	N	Standalone	S	To post
		Active	N	Child	S	To post
		Active	N	Parent	S	To post
		Active	N	Parent	S	To post
		Active	N	Parent	S	To post

pandas – Python のプラグイン



The screenshot shows the pandas website homepage. At the top is a dark blue navigation bar with the pandas logo on the left and links for 'About us', 'Getting started', 'Documentation', 'Community', and 'Contribu'. The main content area has a white background with the pandas logo in large blue text. Below the logo is a description: 'pandas is a fast, powerful, flexible and easy to use open source data analysis and manipulation tool, built on top of the Python programming language.' A blue button with white text says 'Install pandas now!'. To the right, there is a section for version '2.2.3' with a list of links: 'What's new in 2.2.3', 'Release date: Sep 20, 2024', 'Documentation (web)', and 'Download source code'. Below this is a 'Follow us' section with icons for Telegram, Mastodon, and Twitter. At the bottom, there are three columns of links: 'Getting started' (Install pandas, Getting started), 'Documentation' (User guide, API reference, Contributing to pandas, Release notes), and 'Community' (About pandas, Ask a question, Ecosystem). On the far right, there is a 'Recommended books' section featuring the cover of the book 'Python for Data Analysis' by Wes McKinney, published by O'Reilly.

pandas

pandas is a fast, powerful, flexible and easy to use open source data analysis and manipulation tool,
built on top of the Python programming language.

[Install pandas now!](#)

2.2.3

- [What's new in 2.2.3](#)
- [Release date: Sep 20, 2024](#)
- [Documentation \(web\)](#)
- [Download source code](#)

Follow us

[Telegram](#) [Mastodon](#) [Twitter](#)

Getting started

- [Install pandas](#)
- [Getting started](#)

Documentation

- [User guide](#)
- [API reference](#)
- [Contributing to pandas](#)
- [Release notes](#)

Community

- [About pandas](#)
- [Ask a question](#)
- [Ecosystem](#)

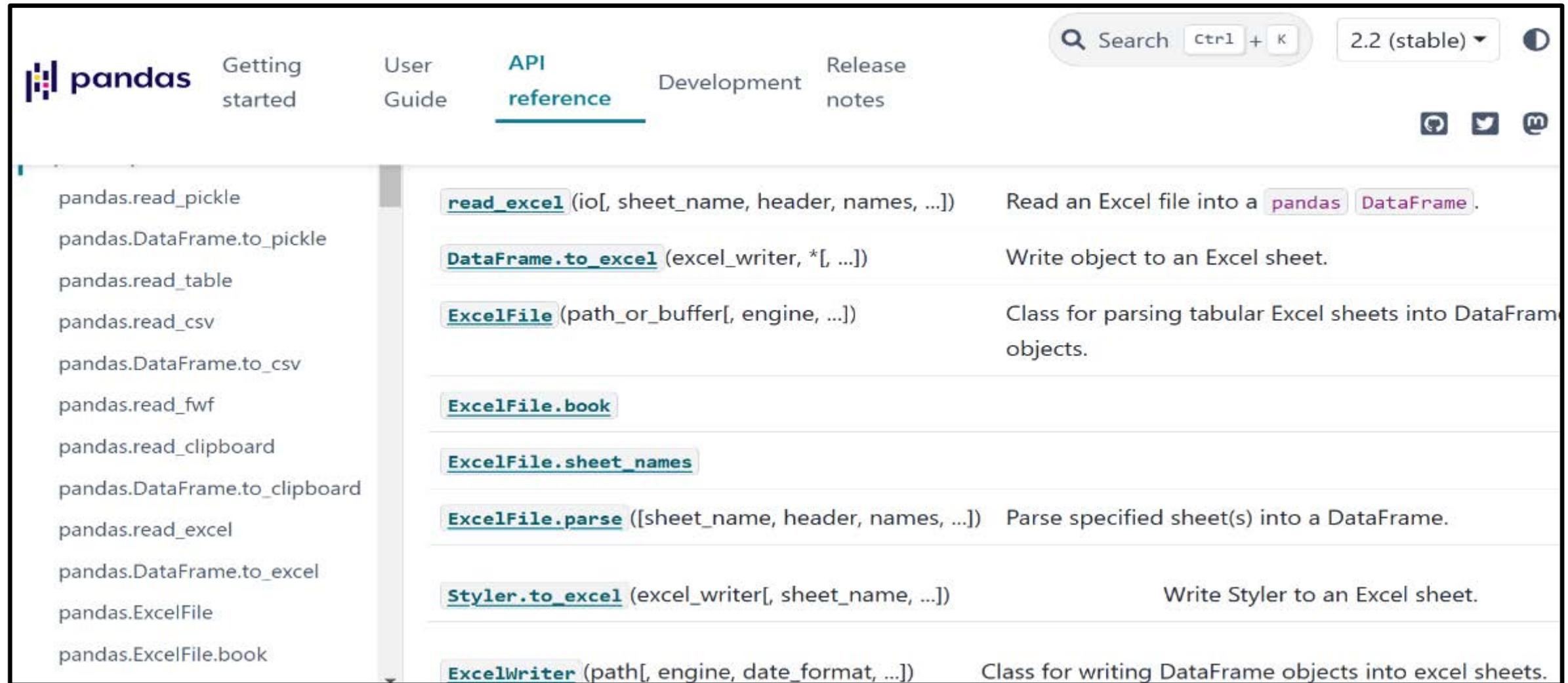
Recommended books

[Python for Data Analysis](#)
Data Wrangling with pandas, NumPy & Jupyter

With the support of:

<https://pandas.pydata.org/>

pandas – Python のプラグイン



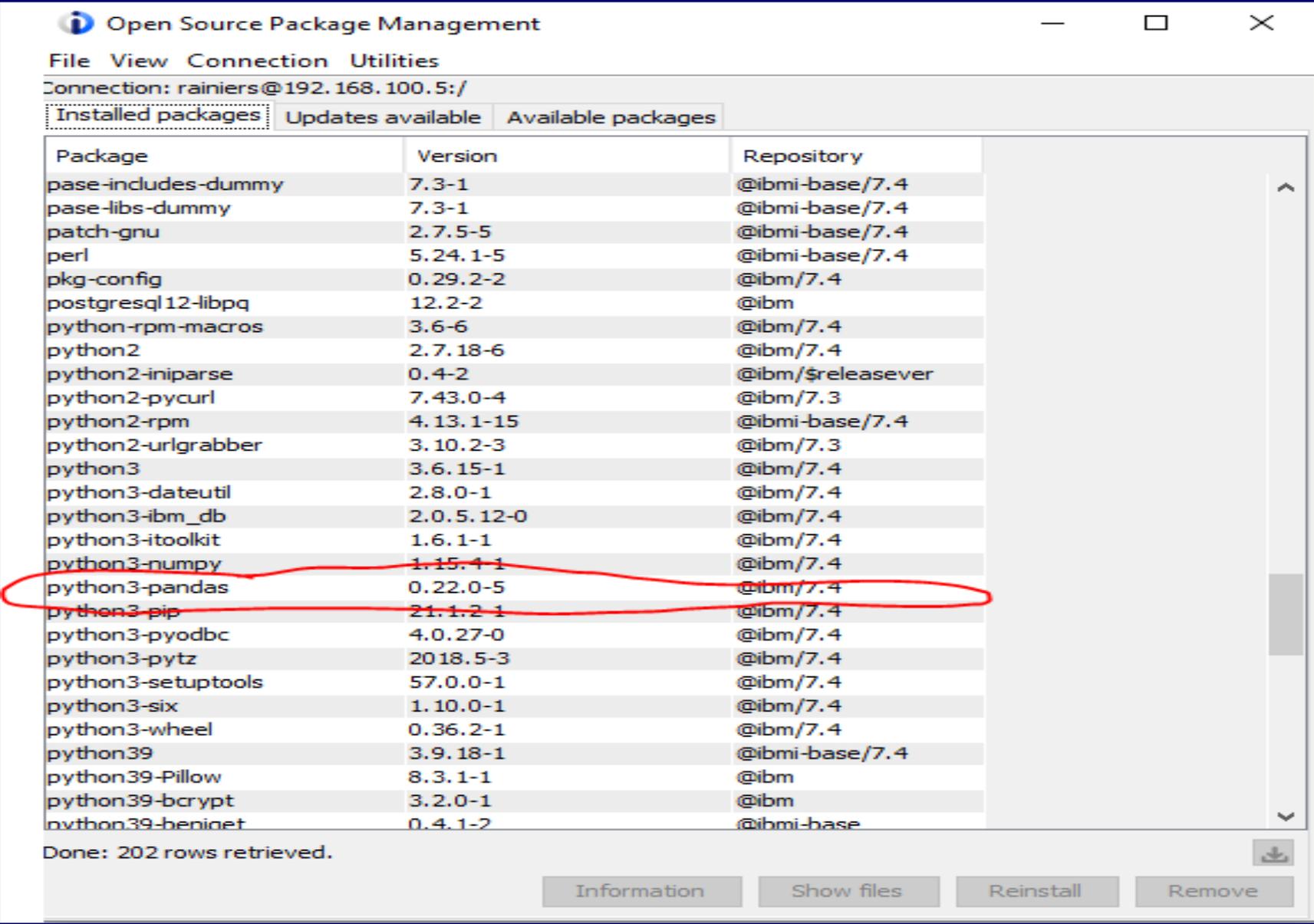
The screenshot shows the pandas API reference page. The top navigation bar includes the pandas logo, links for 'Getting started', 'User Guide', 'API reference' (which is underlined), 'Development', and 'Release notes'. On the right, there is a search bar with 'Search' and 'ctrl + k' shortcuts, a version dropdown set to '2.2 (stable)', and social media icons for GitHub, Twitter, and Medium.

The main content area is divided into two columns. The left column is a scrollable list of API items, and the right column provides detailed descriptions for each item.

<code>pandas.read_pickle</code>	<code>read_excel</code> (io[, sheet_name, header, names, ...])	Read an Excel file into a <code>pandas DataFrame</code> .
<code>pandas.DataFrame.to_pickle</code>	<code>DataFrame.to_excel</code> (excel_writer, *[, ...])	Write object to an Excel sheet.
<code>pandas.read_table</code>	<code>ExcelFile</code> (path_or_buffer[, engine, ...])	Class for parsing tabular Excel sheets into DataFrame objects.
<code>pandas.read_csv</code>	<code>ExcelFile.book</code>	
<code>pandas.DataFrame.to_csv</code>	<code>ExcelFile.sheet_names</code>	
<code>pandas.read_fwf</code>	<code>ExcelFile.parse</code> ([sheet_name, header, names, ...])	Parse specified sheet(s) into a DataFrame.
<code>pandas.read_clipboard</code>	<code>Styler.to_excel</code> (excel_writer[, sheet_name, ...])	Write Styler to an Excel sheet.
<code>pandas.DataFrame.to_clipboard</code>	<code>ExcelWriter</code> (path[, engine, date_format, ...])	Class for writing DataFrame objects into excel sheets.
<code>pandas.read_excel</code>		
<code>pandas.DataFrame.to_excel</code>		
<code>pandas.ExcelFile</code>		
<code>pandas.ExcelFile.book</code>		

<https://pandas.pydata.org/>

pandasはACSを通してインストールでき、IBM i上で直接動作します



Open Source Package Management

File View Connection Utilities

Connection: rainiers@192.168.100.5:/

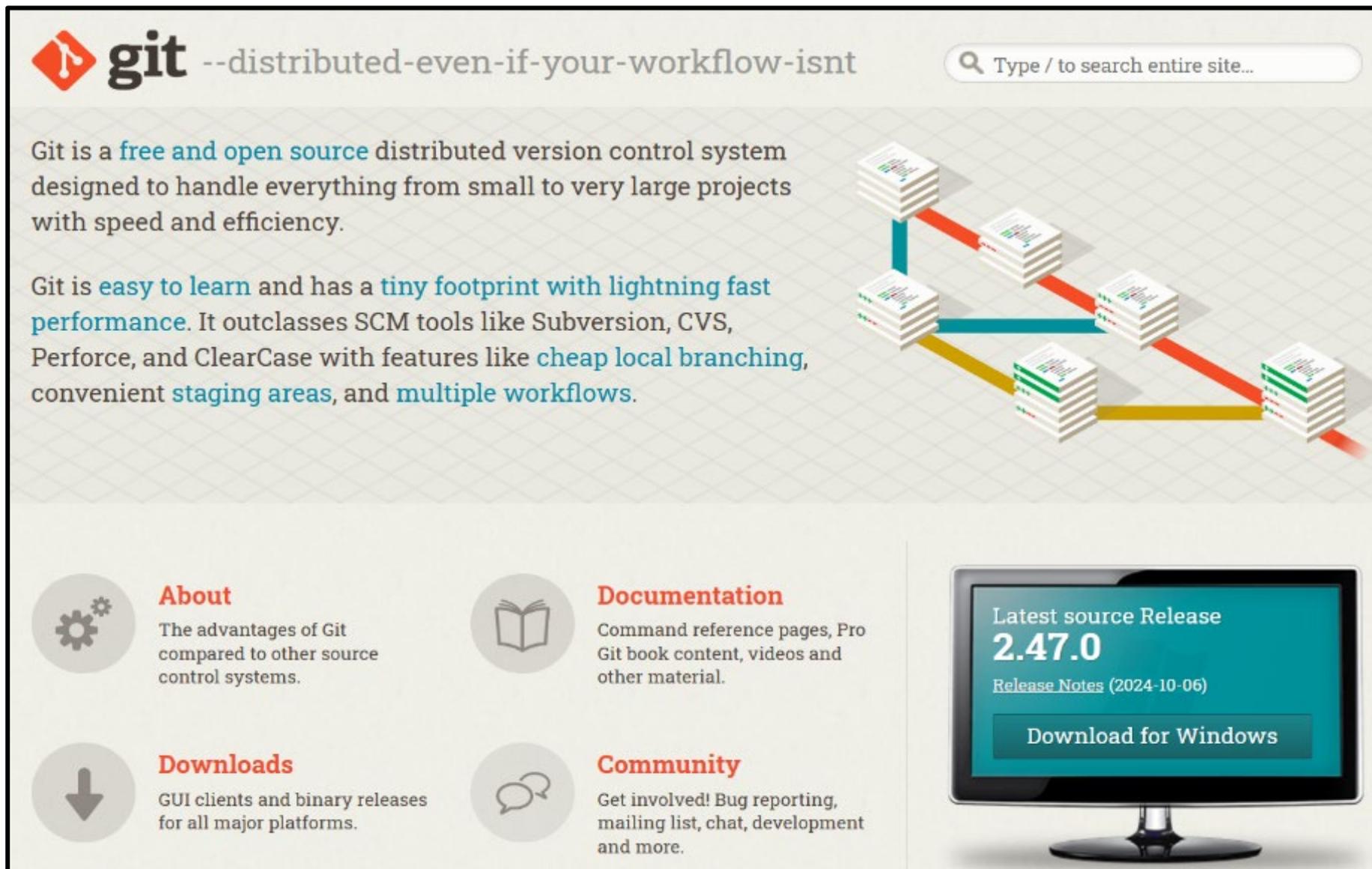
Installed packages Updates available Available packages

Package	Version	Repository
pase-includes-dummy	7.3-1	@ibmi-base/7.4
pase-libs-dummy	7.3-1	@ibmi-base/7.4
patch-gnu	2.7.5-5	@ibmi-base/7.4
perl	5.24.1-5	@ibmi-base/7.4
pkg-config	0.29.2-2	@ibm/7.4
postgresql12-libpq	12.2-2	@ibm
python-rpm-macros	3.6-6	@ibm/7.4
python2	2.7.18-6	@ibm/7.4
python2-iniparse	0.4-2	@ibm/\$releasever
python2-pycurl	7.43.0-4	@ibm/7.3
python2-rpm	4.13.1-15	@ibmi-base/7.4
python2-urlgrabber	3.10.2-3	@ibm/7.3
python3	3.6.15-1	@ibm/7.4
python3-dateutil	2.8.0-1	@ibm/7.4
python3-ibm_db	2.0.5.12-0	@ibm/7.4
python3-itoolkkit	1.6.1-1	@ibm/7.4
python3-numpy	1.15.4-1	@ibm/7.4
python3-pandas	0.22.0-5	@ibm/7.4
python3-pip	21.1.2-1	@ibm/7.4
python3-pyodbc	4.0.27-0	@ibm/7.4
python3-pytz	2018.5-3	@ibm/7.4
python3-setuptools	57.0.0-1	@ibm/7.4
python3-six	1.10.0-1	@ibm/7.4
python3-wheel	0.36.2-1	@ibm/7.4
python39	3.9.18-1	@ibmi-base/7.4
python39-Pillow	8.3.1-1	@ibm
python39-bcrypt	3.2.0-1	@ibm
python39-beautifulsoup4	4.10.0-1	@ibmi-base

Done: 202 rows retrieved.

Information Show files Reinstall Remove

ソース・コントロール・システム



The image is a screenshot of the Git website homepage. At the top left is the Git logo, a red diamond with a white musical note, followed by the text "git --distributed-even-if-your-workflow-isnt". To the right is a search bar with the placeholder text "Type / to search entire site...". Below the header is a large section with a light gray background and a subtle grid pattern. It contains two paragraphs of text describing Git as a free and open source distributed version control system, highlighting its speed, efficiency, ease of learning, and performance. To the right of this text is a 3D diagram showing several stacks of white boxes representing code repositories, connected by colored lines (red, blue, yellow) that illustrate branching and merging. Below this main section are four circular icons with corresponding text: "About" (gears icon), "Documentation" (book icon), "Downloads" (downward arrow icon), and "Community" (speech bubbles icon). On the right side of the page, there is a computer monitor displaying the latest source release "2.47.0" and a "Download for Windows" button.

git --distributed-even-if-your-workflow-isnt

Type / to search entire site...

Git is a **free and open source** distributed version control system designed to handle everything from small to very large projects with speed and efficiency.

Git is **easy to learn** and has a **tiny footprint with lightning fast performance**. It outclasses SCM tools like Subversion, CVS, Perforce, and ClearCase with features like **cheap local branching**, convenient **staging areas**, and **multiple workflows**.

About
The advantages of Git compared to other source control systems.

Documentation
Command reference pages, Pro Git book content, videos and other material.

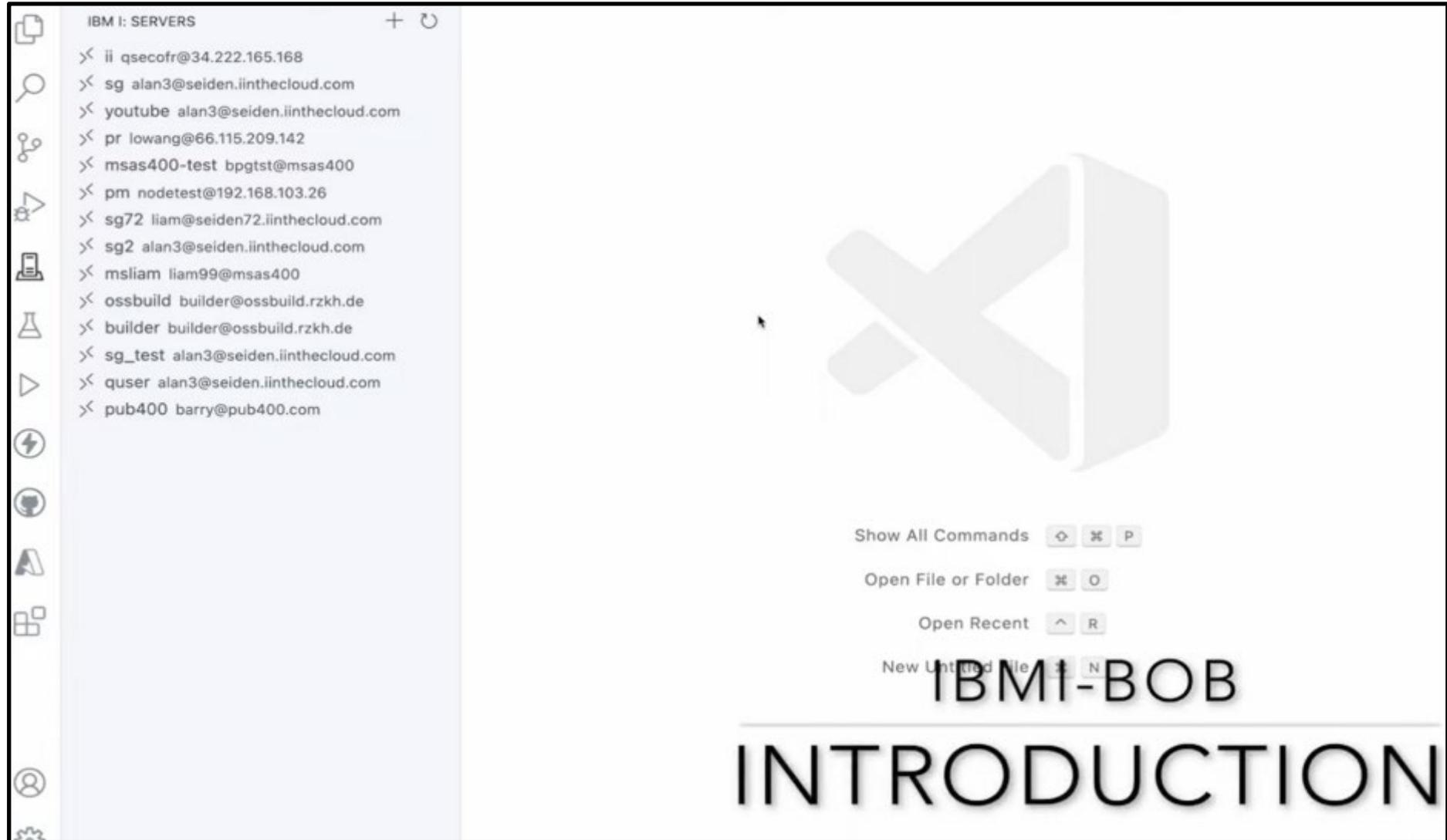
Downloads
GUI clients and binary releases for all major platforms.

Community
Get involved! Bug reporting, mailing list, chat, development and more.

Latest source Release
2.47.0
Release Notes (2024-10-06)
Download for Windows

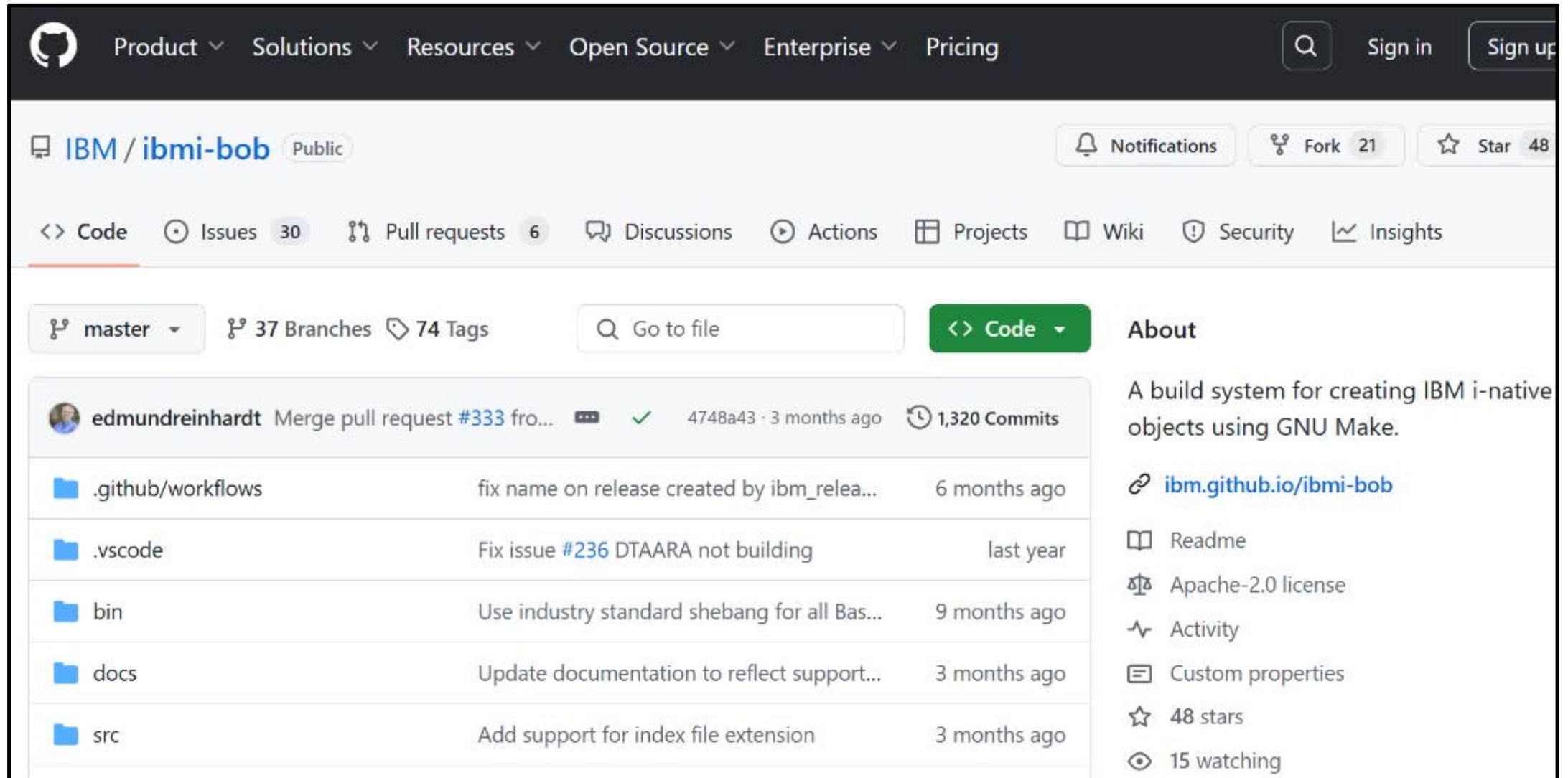
<https://git-scm.com/>

IBMi Bob インストールと紹介ビデオ



<https://www.youtube.com/watch?v=OojAydEUWIU>

IBMi Bob は GitHub からダウンロード可能



The screenshot shows the GitHub repository page for `IBM/ibmi-bob`. The repository is public and has 48 stars, 21 forks, and 30 issues. The main content area displays a list of recent commits, including a merge pull request by `edmundreinhardt` and several other commits related to workflow fixes, documentation updates, and shebang changes. The right sidebar provides an overview of the repository, including a description: "A build system for creating IBM i-native objects using GNU Make." and links to the README, license, and activity.

Product Solutions Resources Open Source Enterprise Pricing

IBM / `ibmi-bob` Public

Notifications Fork 21 Star 48

Code Issues 30 Pull requests 6 Discussions Actions Projects Wiki Security Insights

master 37 Branches 74 Tags Go to file Code

`edmundreinhardt` Merge pull request #333 fro... 4748a43 · 3 months ago 1,320 Commits

<code>.github/workflows</code>	fix name on release created by ibm_relea...	6 months ago
<code>.vscode</code>	Fix issue #236 DTAARA not building	last year
<code>bin</code>	Use industry standard shebang for all Bas...	9 months ago
<code>docs</code>	Update documentation to reflect support...	3 months ago
<code>src</code>	Add support for index file extension	3 months ago

About

A build system for creating IBM i-native objects using GNU Make.

ibm.github.io/ibmi-bob

Readme

Apache-2.0 license

Activity

Custom properties

48 stars

15 watching

<https://github.com/IBM/ibmi-bob>

本日お話しする内容 …

- ・ ご挨拶と会社の説明
- ・ IBM i モダナイゼーション 101
- ・ 実際のケーススタディ
- ・ AI と IBM i
- ・ まとめ

VS Code for IBM i の CoPilotを使ってみる

The screenshot displays the VS Code for IBM i interface. The top menu bar includes File, Edit, Selection, View, and search icons. The breadcrumb path is `ibmi-company_system-main`. The editor shows a file named `EMPLOYEES.SQLRPGLE` with the following code:

```
RDIVSCODE1 > QRPGLSRC > EMPLOYEES.SQLRPGLE > ...
52 230423 End-DS;
53 230423
54 240422 // -----
55 240917
56 230423 Exit = *Off;
57 230423 LoadSubfile();
58 230423
59 230423 Dow (Not Exit);
60 230423   Write FOOTER_FMT;
61 230423   Exfmt SFLCTL;
62 240917
63 240917   counter = 2;
64 230423
65 230423   Select;
66 230423     When (Funkey = F12);
67 230423       Exit = *On;
68 230423     When (Funkey = ENTER);
69 230423       HandleInputs();
70 230423   Ends1;
71 230423 Enddo;
72 230423
73 230423 *INLR = *ON;
74 230423 Return;
```

The CHAT window on the left contains the following content:

CHAT

```
End-Proc;
```

- LoadSubfile**: A procedure to load data into the subfile.
 - `ClearSubfile();`: Calls the `ClearSubfile` procedure to clear the subfile.
 - `EXEC SQL DECLARE empCur CURSOR FOR ...`: Declares a cursor `empCur` to select employee data from the `EMPLOYEE` table where the department number matches the input parameter `DEPTNO`.
 - `EXEC SQL OPEN empCur;`: Opens the cursor.
 - `if (sqlstate = '00000');`: Checks if the SQL state is '00000' (no error).

How can I retrieve the count of employees in a specific department using SQL in RPGLE?

explain in great detail what this program is doing

@ 📎 🗣️ GPT 4o ▶

Watsonx Code Assistant for Z

watsonx watsonx Code Assistant for Z

Home / Z software / Z developer tools / Code Assistant for Z

watsonx Code Assistant for Z

Accelerate the mainframe application lifecycle with generative AI and automation

The screenshot displays the Watsonx Code Assistant for Z interface. On the left, a project structure shows three COBOL program files (L040001, L040002, L040003) and a COBOL program file (L040004) selected. A search icon is visible in the top right corner. The main area shows two code editors. The COBOL editor displays the following code:

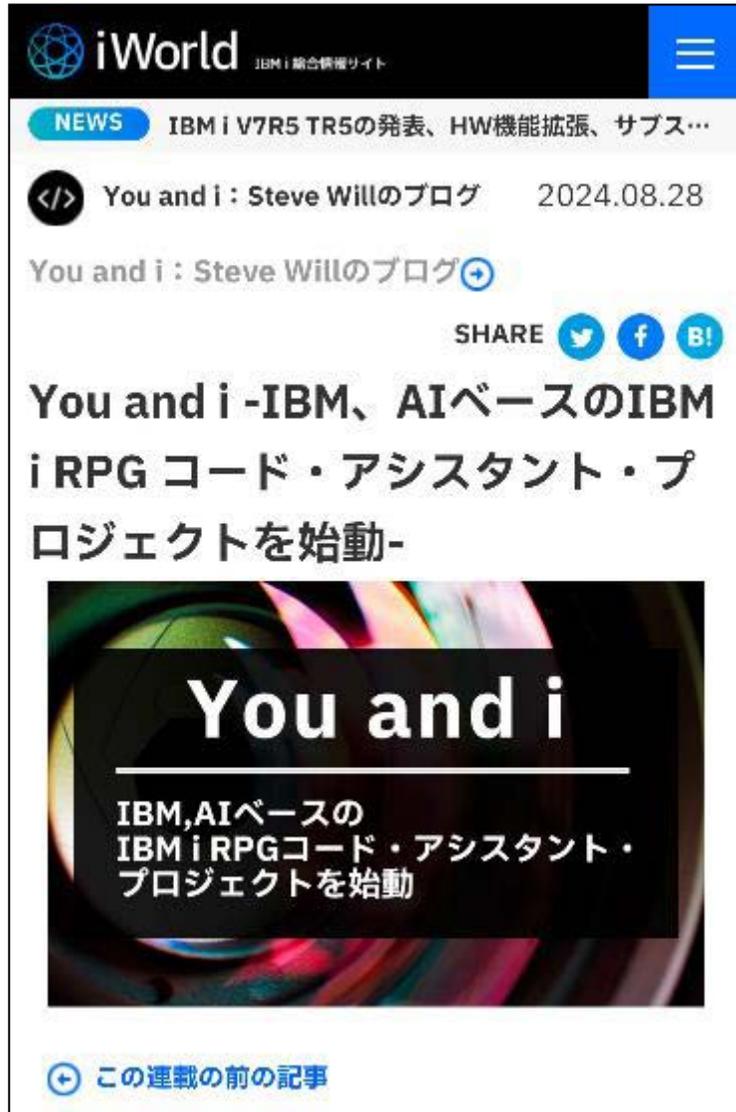
```
1 STRING  
2   | ORG-ID DEPT-NUMBER  
3   | DELIMITED BY SIZE  
4   | INTO DEPT-ID  
5 END-STRING  
6  
7 EXEC SQL  
8   | UPDATE DEPT  
9   | SET MGRNO = 5  
10  | WHERE DEPTNO = DEPT-ID  
11 END-EXEC.  
12  
13 MOVE SQLERRO(3) TO  
   CHANGED-DEPTS.
```

The Java editor displays the following code:

```
1 PreparedStatement stmt =  
  conn.prepareStatement(  
2   | *UPDATE DEPT SET MGRNO = 5  
  | WHERE DEPTNO = ?*  
3  );  
4 stmt.setString(1, orgId +  
  deptNumber);  
5 int changedDepts =  
  stmt.executeUpdate();
```

<https://www.ibm.com/products/watsonx-code-assistant-z>

RPG Code Assistant プロジェクト



“RPGをめぐる戦略で中核となる原則は、お客様が可能な限り最良の結果を得られるようなモダナイゼーションの実現を支援することです。この原則には、「RPGそのものを知らなくても最新のツールを最新の形で使いながら、結果としてRPGを習得できる」ことと、「RPG以外のプログラミング言語を扱える開発者を雇うことで全てのスキルを最大限に活用できるようにする」ことも含まれるのです。”

IBM i CTO Steve Will

https://iworldweb.info/column/serials/20240719_youandi_rpg-code-assistant

RPG Code Assistantについて学ぶ

Type to search



Welcome

- Overview
- How to contribute training data
 - Training Data Format
- Task Description and Examples
 - Explain Existing RPG
 - Generate new RPG
 - Generate Unit Tests for Existing RPG
 - Ask questions about RPG
 - Fixed to Free Format
 - Generate a more modern version of RPG
- How to contribute RPG source
- How to manually contribute to IBM Repo
- How to use UI to contribute training data

Training RPG Generative AI

IBM would like to train generative AI models to understand RPG and IBM i application development. We recognize that many customers have valuable assets and expertise and we want to collaborate on building an AI that will help us all.

How to contribute

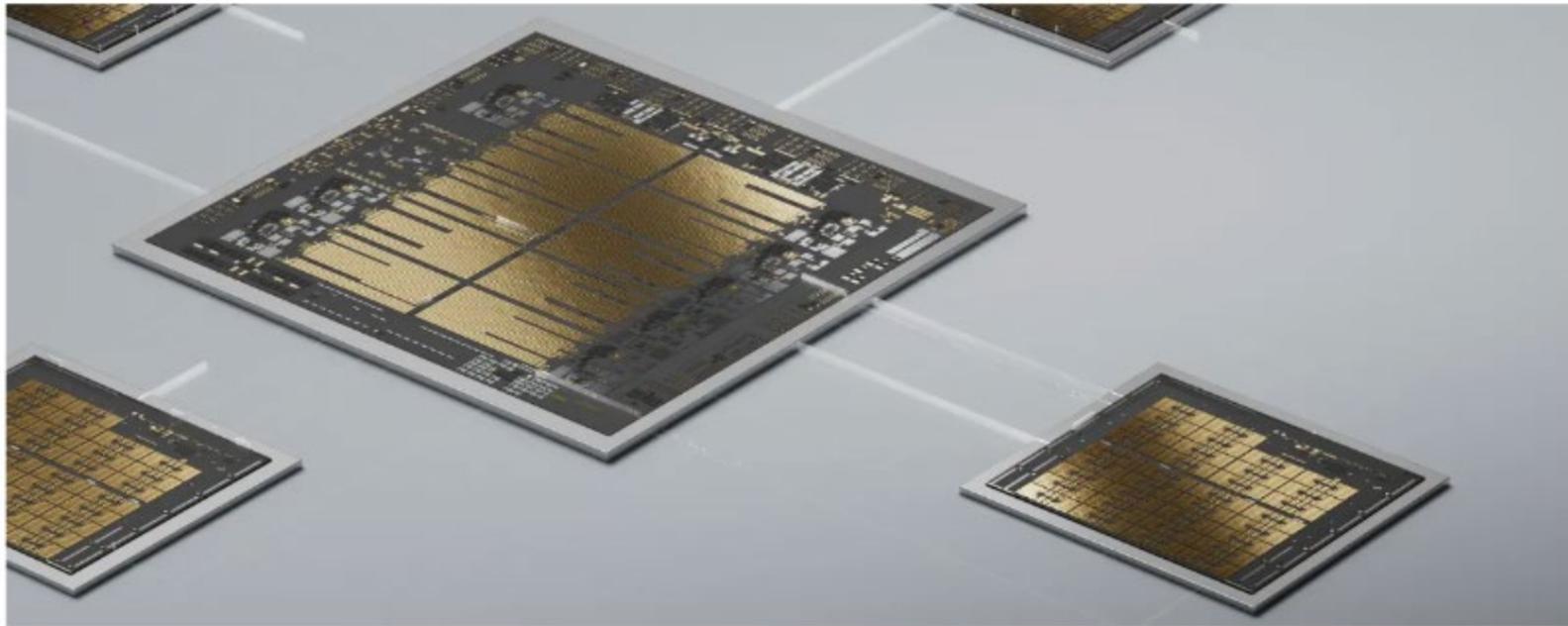
1. Email AlforIBMi@ibm.com to sign up to contribute to training this AI
2. IBM will reach out and ask you to sign the appropriate legal agreements
3. Once you have signed the appropriate agreements, please provide your github id to the same email AlforIBMi@ibm.com. You can create one [here](#)
4. IBM will add you as a contributor to the git repository <https://github.com/AlforIBMi/rpg-genai-data> where we gathering all of the training data.
5. Now it is time to unleash your expertise. Follow the instructions below
 - We would prefer contributing actual question and answer pairs to train the AI following [these instructions](#). We can start fine tuning our model with this data right away.
 - It will also be useful to contribute RPG source code following [these instructions](#). If we get sufficient source we can do a general unlabeled training of our model.
 - In either case, contributing to the IBM git repository for this data should follow [this process](#)

<https://ibm.github.io/rpg-genai-data/#/>

IBM z の Spyre Accelerator Chip とは

Enhancing enterprise AI with the IBM Spyre Accelerator

At Hot Chips 2024, IBM previewed its new Spyre accelerator chip for IBM Z, designed in collaboration with IBM Research, to scale the enterprise AI workloads of tomorrow.



The explosion in AI's capabilities over the last few years has been immense. And we're starting to see how AI can be applied to real business use cases at the scale needed for enterprise demands.

<https://research.ibm.com/blog/spyre-for-z>

Spyre Accelerator Chip が IBM i にもやってくる!!!!

Statement of direction: IBM Spyre accelerator on Power platform

Published: 21 October 2024 AD24-2186 [Statement of direction](#)

Statement of direction

IBM intends to incorporate the IBM Spyre accelerator in future Power offerings to provide additional AI compute capabilities. Working together, IBM Power processors and IBM Spyre accelerator will enable the next generation infrastructure to scale demanding AI workloads for businesses.

Disclaimer: Statements by IBM regarding its plans, directions, and intent are subject to change or withdrawal without notice at the sole discretion of IBM. Information regarding potential future products is intended to outline general product direction and should not be relied on in making a purchasing decision. The information mentioned regarding potential future products is not a commitment, promise, or legal obligation to deliver any material, code, or functionality. Information about potential future products may not be incorporated into any contract. The development, release, and timing of any future features or functionality described for IBM products remain at the sole discretion of IBM.

<https://www.ibm.com/docs/en/announcements/statement-direction-spyre-accelerator-power-platform>

AIはどこにでも！ - サーバーセキュリティ

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Home / AI Cybersecurity

Artificial intelligence (AI) cybersecurity

Improve the speed, accuracy and productivity of security teams with AI-powered solutions

[Explore our solutions](#) | [Get the 2024 Cost of a Data Breach report](#)

AI to accelerate your security defenses

Today's security teams face many challenges—sophisticated hackers, an expanding **attack surface**, an explosion of data and growing infrastructure complexity—that hinder their ability to **safeguard data**, **manage user access**, and quickly detect and respond to AI security threats.

IBM Security® provides transformative, AI-powered solutions that optimize analysts' time—by accelerating **ai threat detection and mitigation**, **expediting responses**, and protecting user identity and datasets—while keeping cybersecurity teams in the loop and in charge.

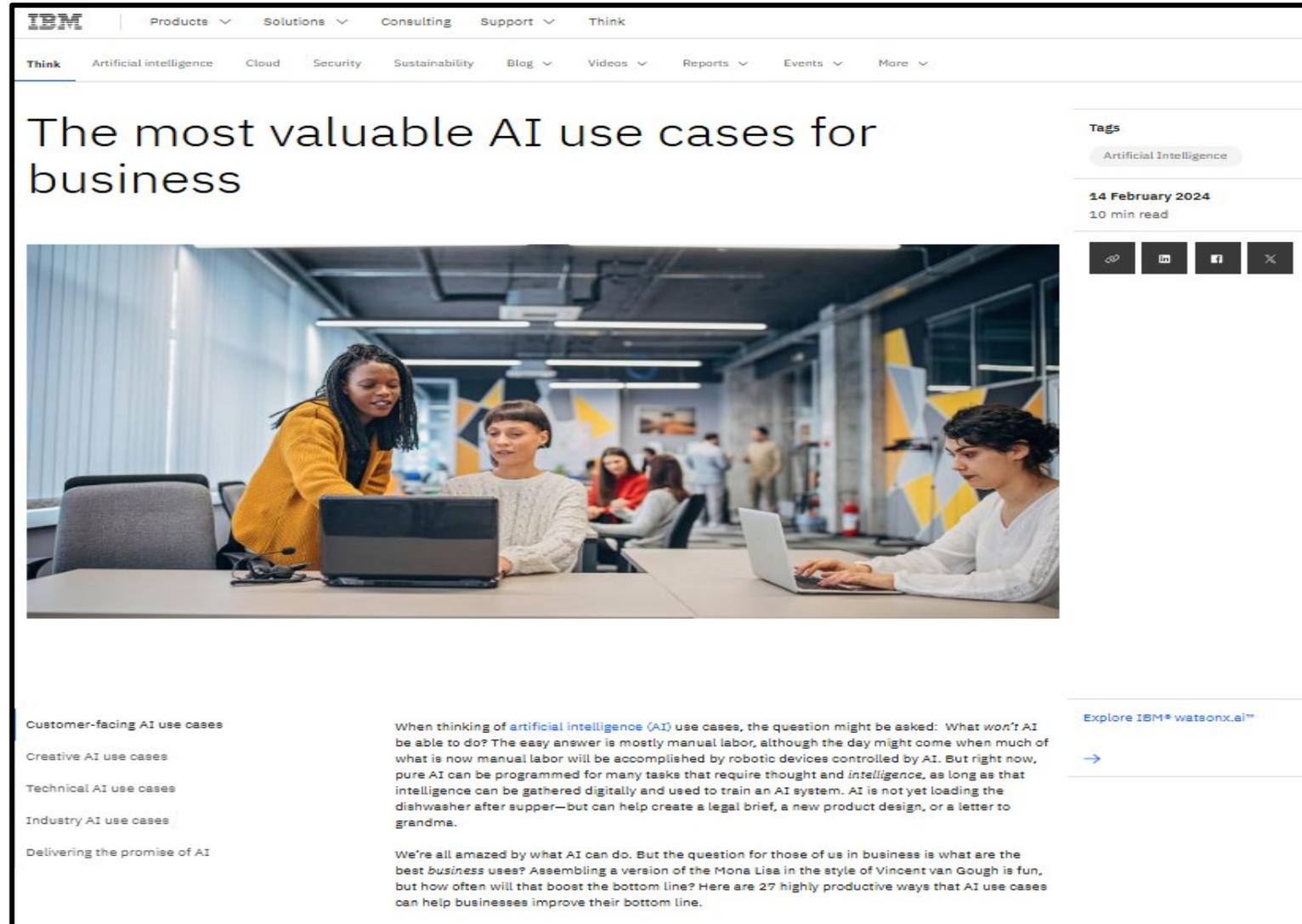
Webinar
How Generative AI Changes the Cybersecurity Landscape

Cain valuable insights into the future of AI in cybersecurity and learn how to stay ahead of evolving threats.

Auto AI

<https://www.ibm.com/ai-cybersecurity>

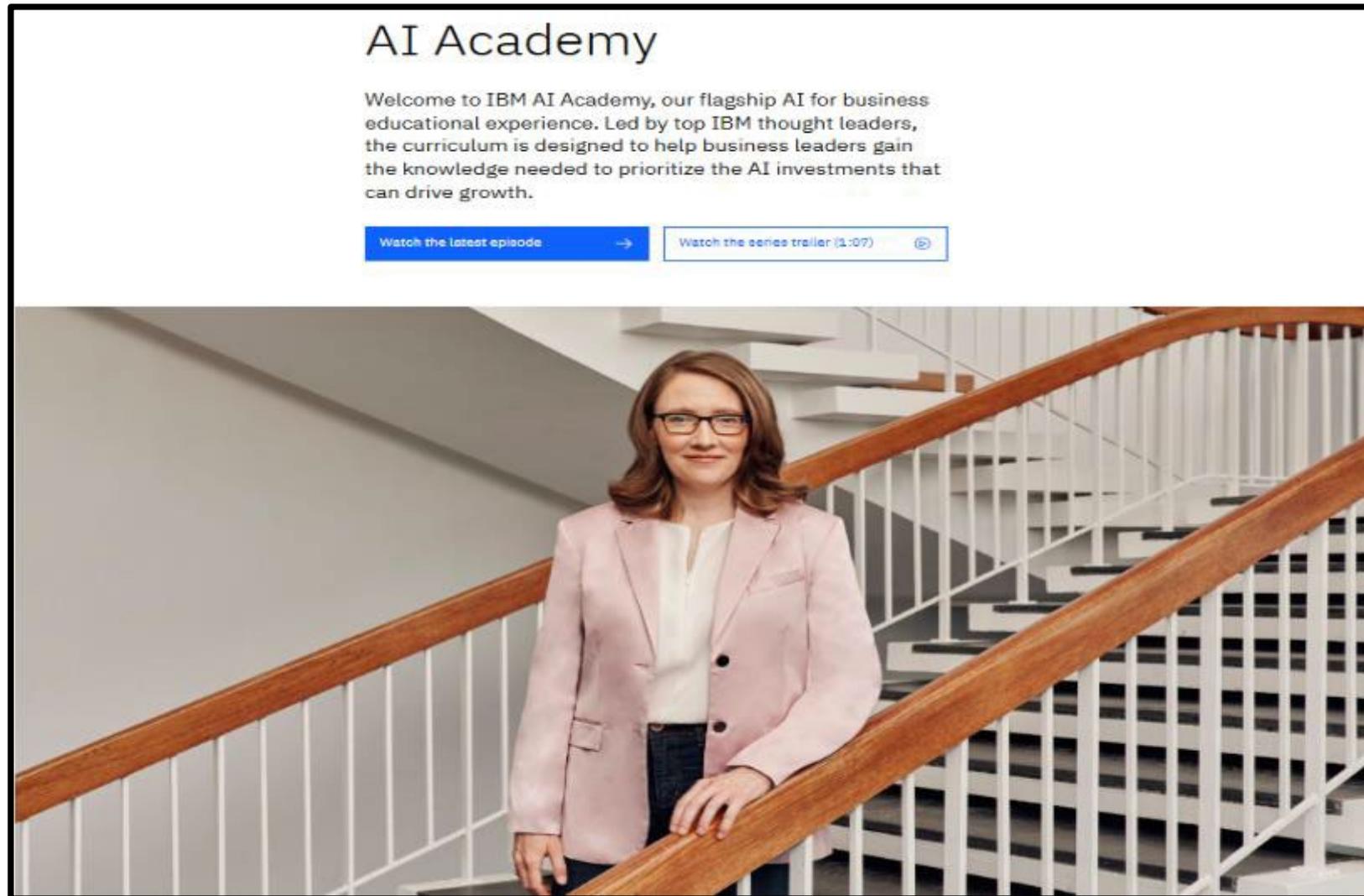
ビジネス・ユースケース



The screenshot shows the IBM website's article page. At the top is the IBM logo and a navigation menu with categories like Products, Solutions, Consulting, Support, and Think. Below this is a secondary menu with sub-categories such as Artificial intelligence, Cloud, Security, and Sustainability. The main heading of the article is 'The most valuable AI use cases for business'. To the right of the heading, there is a 'Tags' section with 'Artificial Intelligence', a date of '14 February 2024', and a '10 min read' indicator. Below the text are social media sharing icons for LinkedIn, Facebook, and a close button. A large photograph shows three women in a modern office setting, two of whom are looking at a laptop. Below the photo, there are four links for related content: 'Customer-facing AI use cases', 'Creative AI use cases', 'Technical AI use cases', and 'Industry AI use cases'. The main body of text begins with a paragraph asking 'What won't AI be able to do?' and discussing manual labor and AI capabilities. A second paragraph starts with 'We're all amazed by what AI can do...' and discusses business uses. On the right side, there is a link that says 'Explore IBM® watsonx.ai™' with a right-pointing arrow.

<https://www.ibm.com/think/topics/artificial-intelligence-business-use-cases>

AIはどこにでも！ - AI アカデミー



<https://ibm.com/think/videos/ai-academy>

AIはどこにでも！ - AI アカデミー

Track 1: Strategic essentials



Track 1
Achieving AI-readiness with hybrid cloud

Your IT infrastructure should fit together like a puzzle. Learn how the operational agility and scalability of hybrid cloud can help your business get the most value from AI.

[Go to episode →](#)

Track 1
From pilot to production: Driving ROI with genAI

Want to get a better return on your AI investments? Learn how scaling gen AI in key areas drives change by helping your best minds build and deliver innovative new solutions.

[Go to episode →](#)

Track 1
How responsible AI can prepare you for regulations

Learn how AI governance can help ensure your organization's AI efforts are led responsibly and ethically. Then use our guidebook to help prepare your organization for new AI regulations.

[Go to episode →](#)

◀ 1 / 2 ▶

Track 2: Elements of enterprise AI



Track 2
Design a hybrid cloud infrastructure for and with AI

Track 2
Choose the right AI model for your use case

Track 2
Is data management the secret to generative AI?

<https://ibm.com/think/videos/ai-academy>

本日お話しする内容 …

- ・ ご挨拶と会社の説明
- ・ IBM i モダナイゼーション 101
- ・ 実際のケーススタディ
- ・ AI と IBM i
- ・ まとめ

未来志向の開発： IBM iの可能性を最大限に引き出す 最新ツールの活用



Charles Guarino

ご清聴ありがとうございました！！！！