Open Source & IBM i
Dernières nouveautés...

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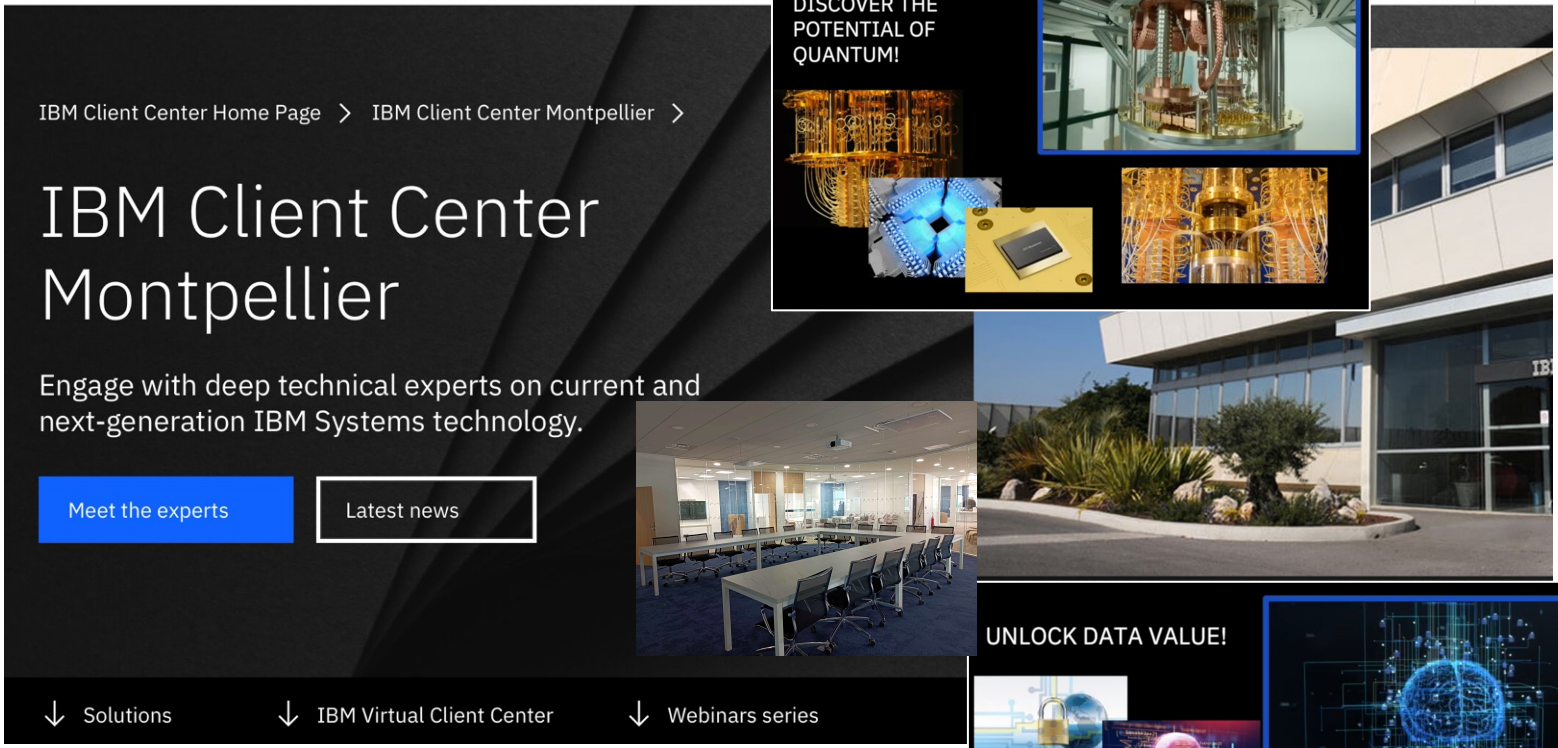
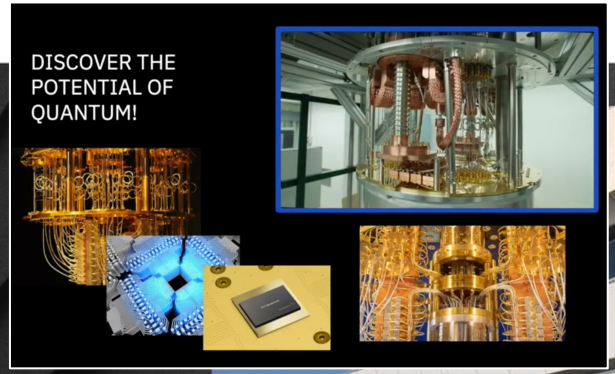
https://ibm.biz/bma-wiki

Co-auteur, merci à Philippe Bourgeois!

open source

IBM Systems Center Montpellier





IBM Watson

IBM Z

AIX

IBM i

IBM Blockchain

IBM Q

IBM Cloud

Red Hat

OPENSHIFT

open source

https://www.ibm.com/ibm/clientcenter/montpellier

Support Client PoC, Workshops, Benchmaks...

Parternaires Workshops, Formations

Editeurs , Intégrateurs....

Open Source sur IBM i – Rappels

- Pourquoi l'Open Source sur IBM i ?
  - Nouvelles possibilités → ouverture de l'IBM i
    - Pour les **administrateurs** système
      - Déploiement automatisé d'applications, vérification de conformité, clonage de partition, synchronisation de fichiers, gestion de certificats, ZIP/UNZIP, création de sandbox…
    - Pour les **développeurs**
      - Echange de données par messages, gestion de PDF, appel de Services Web, de SMS, gestion événementielle, intégration de flux vidéo, IA, contrôle de sources (Git), DevOps (CI/CD)…
  - Portage d'applications
  - Facilité pour trouver des compétences
  - Evolutions permanentes
  - Passerelle vers l'IA, l'IOT, les technos Web, l'informatique quantique…

Open Source – Rappels

- Des exemples de ce qui a été délivré :

Open Source – Rappels

- Des exemples de ce qui a été délivré :
  - **Bases de données**
    - PostgreSQL, MariaDB, SQLite
  - **Langages**
    - PHP communautaire, Node.js, Python, R, Perl…
  - **Développement et connectivité**
    - Node-RED, GCC, Driver ODBC…
  - **DevOps**
    - Git, Ant, Maven
  - **Echange de données, flux de données**
    - ActiveMQ, Kafka
  - **Editeurs**
    - Orion, sed, nano, vim
  - **Utilitaires**
    - Ansible, cURL, jq, rsync, bash, chroot, cloud-init, updatedb, locate, man, 7zip…
  - **Serveur HTTP**
    - Nginx

Open Source – Connectivité IBM i

- Il existe plusieurs possibilités pour se connecter à l'IBM i :

ODBC	Now available for IBM i, Mac, Windows, Linux Language toolkits have built-in support
SSH	New(ish) deliveries from IBM make this easier Language toolkits have built-in support
REST APIs	Expose with IWS or a variety of open source
Enterprise Messaging	IBM MQ, ActiveMQ, Kafka, etc.
Apache Camel	Java-based framework Connect IBM i to (almost) anything

Nouveautés Open Source IBM i 2020-2021

- 1. Documentation – Installation – Support
- 2. Driver ODBC natif IBM i
- 3. PHP Communautaire
- 4. Bases de données PostgreSQL
- 5. Utilitaires
- 6. Node-RED
- 7. Ansible
- 8. Camel – Kafka
- 9. Conclusion - Next Gen Apps, Cloud, Containers...

IBM i

IBM i Anywhere
IBM i Everywhere

1. Documentation, installation et support

Open Source et IBM i

Open Source Technologies

News

Abstract

Open Source Technologies

Content

You are in: IBM i Technology Updates > Open Source Technologies

Open Source for IBM i

IBM i has a multitude of open source packages available, including Java, PHP, Node.js, OpenSSH, OpenSSL, Ruby, git, and much more! Much of this software is built and delivered with RedHat technology and can be installed and managed with RPMs and the Yum package manager. Formal support for many packages is available from IBM and partners.

For more information, see the related URLs on how to get started, chat with others, or obtain support.

Related Information

IBM i Open Source Resources

Getting Started with IBM i RPMs

Information about obtaining support for open source software

IBM i Open Source Chat (requires you to join at link below)

IBM i Open Source Chat - Join/Signup

Open Source Examples Repository (GitHub)

Open Source et IBM i – Documentation

View on GitHub

ibmi-oss-resources

Important resources for anyone interested in open source on IBM i

IBM i Open Source Resources

Important resources for anyone interested in open source on IBM i

Documentation - General

- IBM i Open Source documentation from IBM
- Getting Started with IBM i RPMs

Documentation - Specific

- Node.js itoolkit
- Node.js odbc module
- Node.js idb-connector module
- Node.js idb-pconnector module
- Loopback (Node.js API framework) connector
- Python itoolkit
- Python SQLAlchemy Adapter
- XMLService
- ODBC driver
- PostgreSQL
- PHP options for IBM i
- Ruby on IBM i
- IBM i chroot containers
- Self-signed TLS certificate validation in IBM i OSS

Support

- Open Source Support for IBM i

Examples

- IBM i Open Source Examples

Community

- IBM i Open Source Chat on Ryver (must first join at this link)
- IBM i Community Slack
- IBM Community pages for IBM i
- IBMiOSS LinkedIn group
- #IBMiOSS hashtag on Twitter

Blogs

- Kevin Adler's Blog
- Seiden Group Blog
- FAQ400 Blog
- Anand Khekale's Technical Musings

Videos

- JORI + IBM i: Designing digital transformation
- FormaServ video library
- The Bearded Geek on IBM i - Youtube Channel

Open Source et IBM i – Documentation

IBM i Customer Stories

- IBM i Customer Stories page

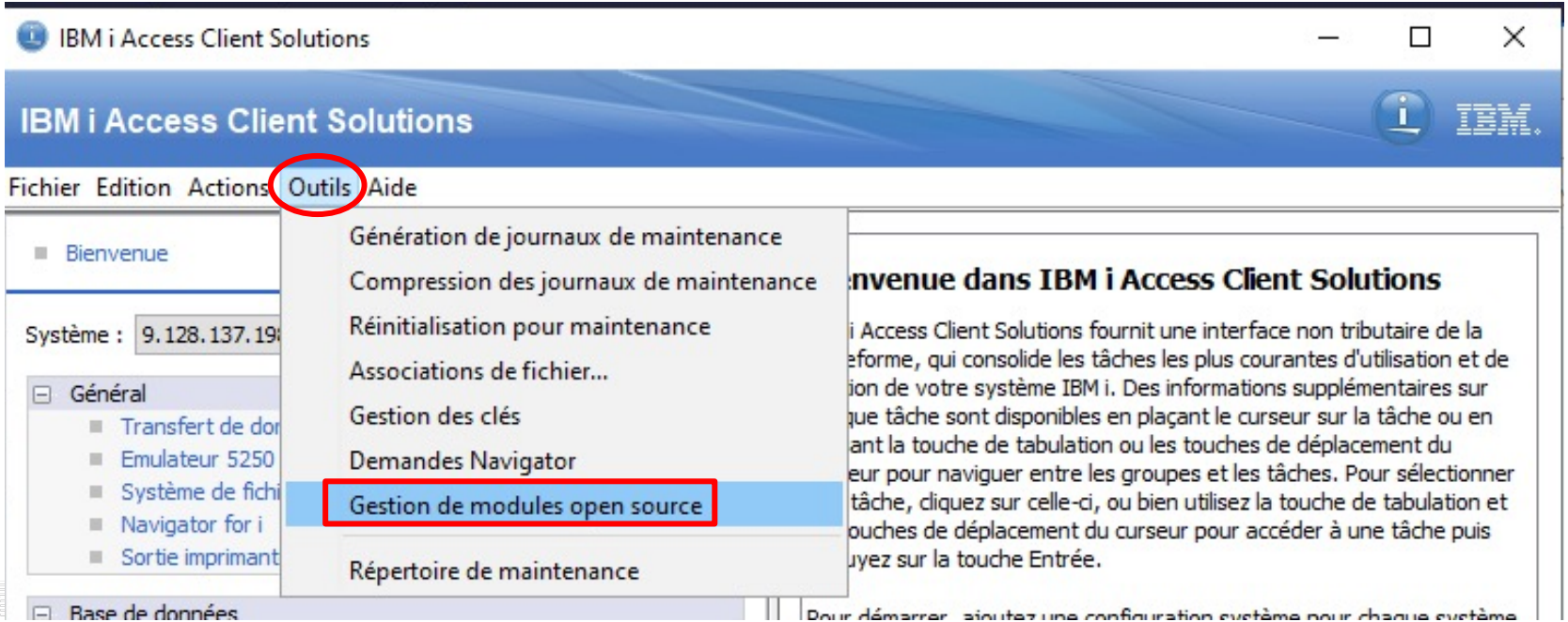
Individual customer stories

Company (link)	Synopsis
SAIB	Using Node.js to integrate with Amazon Alexa
Genetco	Updating their ERP system and implementing new GUI interfaces
Trans Am Piping Products	Using PHP to redesign their website and increase productivity
Magid	Transforming green screen UIs to PHP
JDS Industries	Several digital transformation projects us PHP, including mobile and Google Maps integration
Hatco Corporation	Using PHP for web presence, and git for source control
Stonetales Properties	Using Node.js to build new solutions when acquiring another company
FormaServ Systems	Using Node.js to enable and streamline digital tax filing in the UK
RPC Superfos	Using open source languages such as Python and Node.js for frontend user interface modernization
King III Solutions	Using PHP in a loosely-coupled fashion to modernize and build new solutions
H/T Bendix	Using Node.js for web presence and product catalog
ORIS	Using Drupal and other open source technologies to create an online portal for rental properties
Norwegian Air Ambulance Foundation	Using open source to digitally transform air ambulance operations
Sunstate	Using PHP to digitize and streamline parts procurement
Mutual Distributing Company	Leveraging multiple languages, including RPG, Node.js, Ruby, Python and PHP, to enable web presence and mobile integration

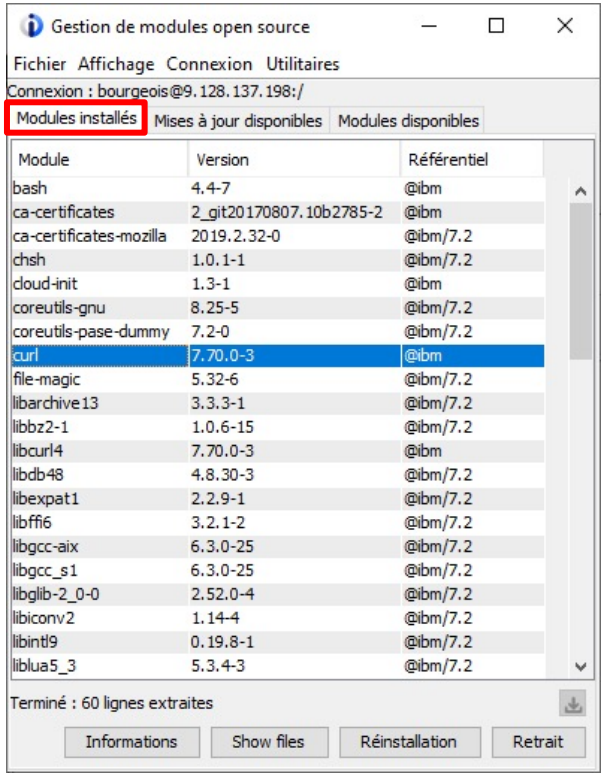
Case Studies

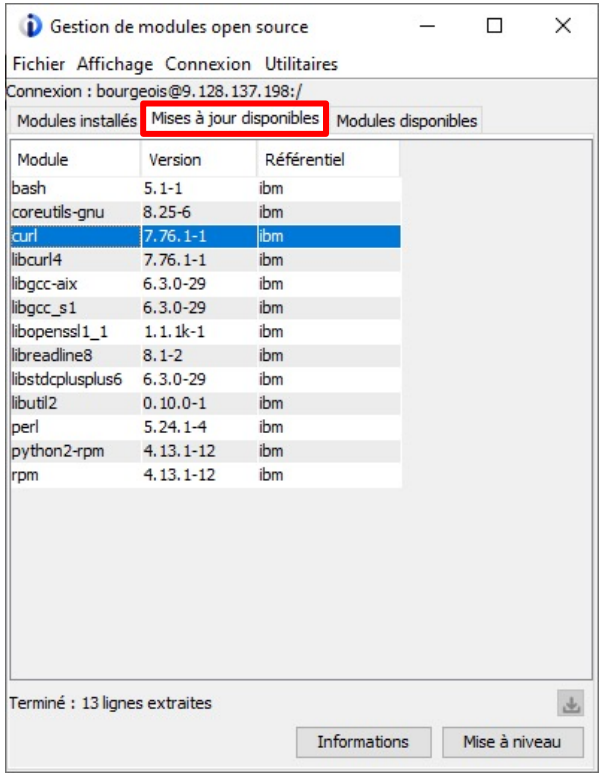
Company (link)	Synopsis	Quote
CRAS	Deployed Node-RED to integrate with PLC IoT devices	*"The ability to run the latest open source software alongside unmodified code from the 1980s is surely unheard of on any other platform, and this offers huge value to our*

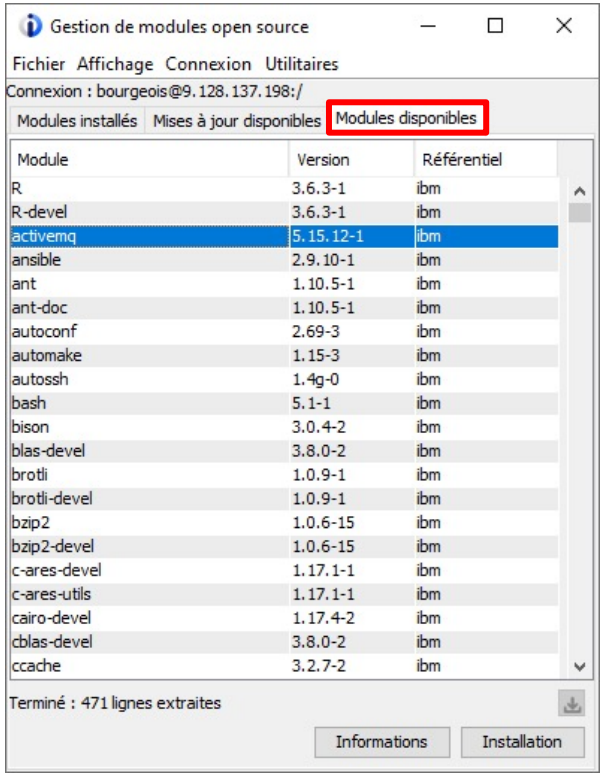
Open Source et IBM i – *Installation*



Open Source et IBM i – Installation







Open Source et IBM i – *Support*

- Support compris dans la **SWMA IBM i** :
  - L'installation des packages par YUM ou par ACS
  - Les produits sous licence (5733-DG1 et 5733-SC1)

- Pour les packages **RPM**, deux possibilités :
  - 1. Support **communautaire**, gratuit
    - Suivi d'incidents : https://github.com/IBM/ibmi-oss-issues/
    - Chat : http://ibm.biz/ibmioss-chat (inscription : http://ibm.biz/ibmioss-chat-join)
  - 2. Support **IBM** TSS (Technology Support Services), facturable
    - https://www.ibm.com/support/pages/open-source-support-ibm-i →

Open Source et IBM i – Support

- Support **IBM**

Open Source Support for IBM i

The following products can be supported on IBM i. Please note that this list is updated regularly and might not be exhaustive. For packages not listed here, please discuss with your seller. We may be able to add support or offer a special bid to fit your needs:

- ActiveMQ
- Ansible
- Apache Ant
- Apache Camel
- Apache Commons
- Apache Kafka
- Apache Maven
- Apache Tomcat
- Apigility
- Curl
- Drupal
- Git
- GNU Make
- GNU awk (gawk)
- GNU sed
- Jenkins
- Joomla
- Loopback
- Nginx
- Node.js
- PCRE
- PHP
- Perl
- Python
- R
- Redis
- Rsync
- Spring
- Vim
- Wordpress
- Zookeeper

IBM i

IBM i Anywhere
IBM i Everywhere

2. Driver ODBC natif IBM i

Le driver ODBC natif IBM i

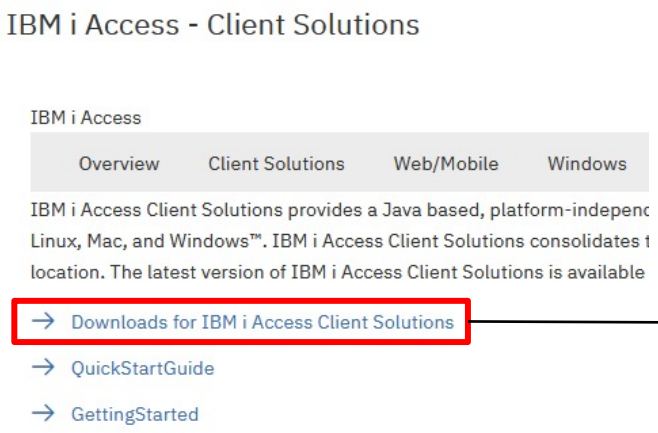
- Le driver ODBC est disponible sous 4 OS :
  - Windows
  - Linux
  - Mac OS
  - **IBM i**

- **Pourquo**i un driver ODBC natif IBM i ?
  - Pour pouvoir utiliser les libraries ODBC standard à partir de différents langages (PHP, Python, Node.js, Ruby, R...)
  - Pour pourvoir développer des applications sous Windows/Linux et les déployer sous IBM i

- **Comment** récupérer ce driver ODBC natif IBM i ?
  - En téléchargeant le "IBM i PASE ODBC Driver" à partir du site de téléchargement d'ACS

Installation

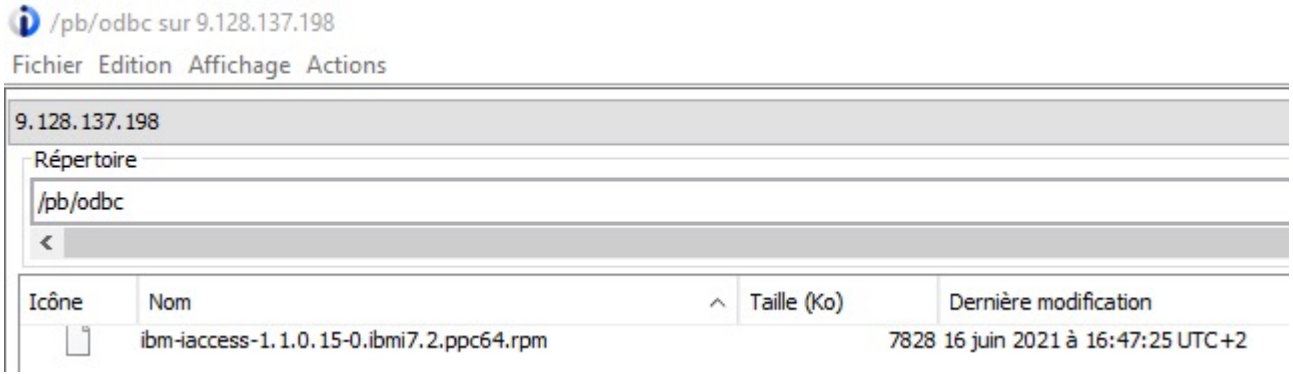
- Installation du "IBM i PASE ODBC Driver"
  - https://www.ibm.com/support/pages/ibm-i-access-client-solutions



Description	Filename	Size	Action
IBM i Access Client Solutions (1.1.8.7)	IBMiAccess_v1r1.zip	141195249 B	Download
Readme file for 5733-XJ1	Readme.txt	5 KB	Download
Quick Start Guide	QuickStartGuide_en.html	11 KB	Download
Getting Started	GettingStarted_en.html	122 KB	Download
ACS EHLLAPI - Version 8.21.102	acshllapi.exe	986935 B	Download
ACS Windows App Pkg English (64bit)	IBMiAccess_v1r1_WindowsAP_English.zip	53686358 B	Download
ACS Linux App Pkg	IBMiAccess_v1r1_LinuxAP.zip	20147169 B	Download
ACS PASE App Pkg	IBMiAccess_v1r1_PASE_AP.zip	8314619 B	Download
ACS Mac App Pkg	IBMiAccess_v1r1_macOS_AP.zip	3791359 B	Download

Installation

- Installation du "IBM i PASE ODBC Driver"
  - Dézipper le fichier résultat du Download (`IBMiAccess_v1r1_PASE_AP.zip`) et copier le fichier **`ibm-iaccess-1.1.0.xx-0.ibmi7.2.ppc64.rpm`**) dans un répertoire de votre choix dans l'IFS



Installation

- Installation du "IBM i PASE ODBC Driver"

```
> yum install /pb/odbc/ibm-iaccess-1.1.0.15-0.ibmi7.2.ppc64.rpm
  Configuration du processus d'installation
  Examen de /pb/odbc/ibm-iaccess-1.1.0.15-0.ibmi7.2.ppc64.rpm : ibm-iaccess-1.1
  .0.15-0.ppc64
  Sélection de /pb/odbc/ibm-iaccess-1.1.0.15-0.ibmi7.2.ppc64.rpm pour installat
  ion
  Résolution des dépendances
```

...

```
  Installé :
    ibm-iaccess.ppc64 0:1.1.0.15-0

  Terminé !
  $
```

Modules installés | Mises à jour disponibles | Modules disponibles

Module	Version	Référentiel
curl	7.70.0-3	@ibm
file-magic	5.32-6	@ibm/7.2
grep-gnu	3.0-2	@ibm
ibm-iaccess	1.1.0.15-0	@/ibm-iaccess-1.1.0.15-0.ibmi7.2.ppc64
libarchive13	3.3.3-1	@ibm/7.2
libbz2-1	1.0.6-15	@ibm/7.2

Installation

- Installation du "IBM i PASE ODBC Driver"
  - Fichier **`odbc.ini`** fourni par défaut (dans `/QOpenSys/etc`) :

```
> cd /qopensys/etc
  $
> cat odbc.ini

  ### IBM provided DSN - do not remove this line ###
  [*LOCAL]
  Description = Default IBM i local database
  Driver      = IBM i Access ODBC Driver
  System      = localhost
  UserID      = *CURRENT
  ### Start of DSN customization
  ### End of DSN customization
  ### IBM provided DSN - do not remove this line ###
  $
```

On peut indiquer le nom ou l'@IP d'une base de données distante

PTFs nécessaires pour utiliser *CURRENT comme profil sans mot de passe :

- 7.2 : SI69058
- 7.3 : SI68113
- 7.4 : aucune

  - Documentation : https://github.com/IBM/ibmi-oss-examples/blob/master/odbc/odbc.md

Test


```
> isql *LOCAL
  +-----------------------------------+
  | Connected!                        |
```

```
  SQL>
> select * from video.films
```

CODFILM	CODREA	TITRE	GENRE	DUREE	ANNEE
1	12	MEILLEUR (LE)	O	129	1984
29	10	POURSUITE IMPITOYABLE (LA)	D	135	1965
37	6	RIDEAU DECHIRE (LE)	P	125	1966
64	2	HOMMES DU PRESIDENT (LES)	H	126	1976

IBM i

IBM i Anywhere
IBM i Everywhere

3. PHP Communautaire

PHP communautaire versus PHP avec Zend Server

- *Zend Server **Basic** Edition* n'est plus livré avec l'IBM i depuis le 30/06/2020
- *Zend Server **Basic** Edition* ne sera plus édité par Perforce (anciennement Zend) à partir du 30/06/2021
- A aujourd'hui pour faire du PHP sous IBM i, il existe 2 solutions :
  - 1. Zend Server dans les éditions ***Professional*** ou ***Enterprise***

zend PERFORCE

COMPARISON CHART

Zend Server for IBM i Editions

PRODUCTION EDITION DETAILED FEATURE COMPARISON

Features	**Basic** For getting started with PHP on IBM i	**Professional** For running business critical applications	**Enterprise** For running mission critical, enterprise applications
Support and Security Fixes			
Support via...	Web Tickets	Phone	Phone (24x7x365)
P1 Response Time	2 Business Days	6 Business Hours	2 Hours
Security Hot Fixes	✘	✔	✔
PHP, ZF 1 & 2 & Apigility Support	✘	✔	✔
Long-Term Support (LTS)	✘	✔	✔
Customer Requested Fixes for PHP, ZF 1 & 2 & Apigility	✘	✘	✔

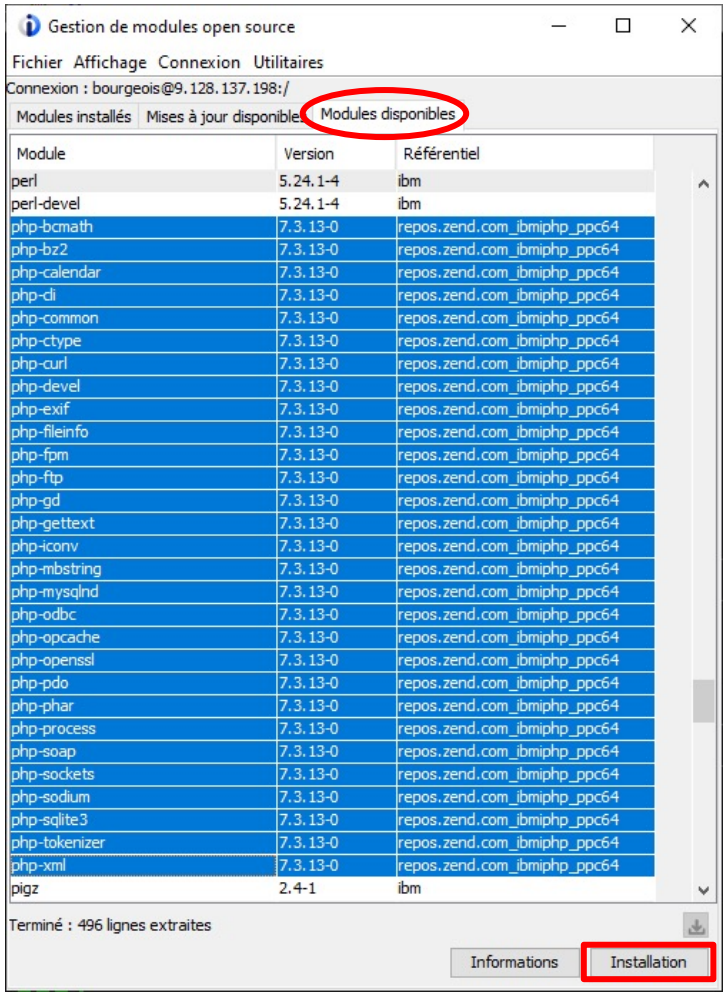
. . .

  - 2. PHP **communautaire**

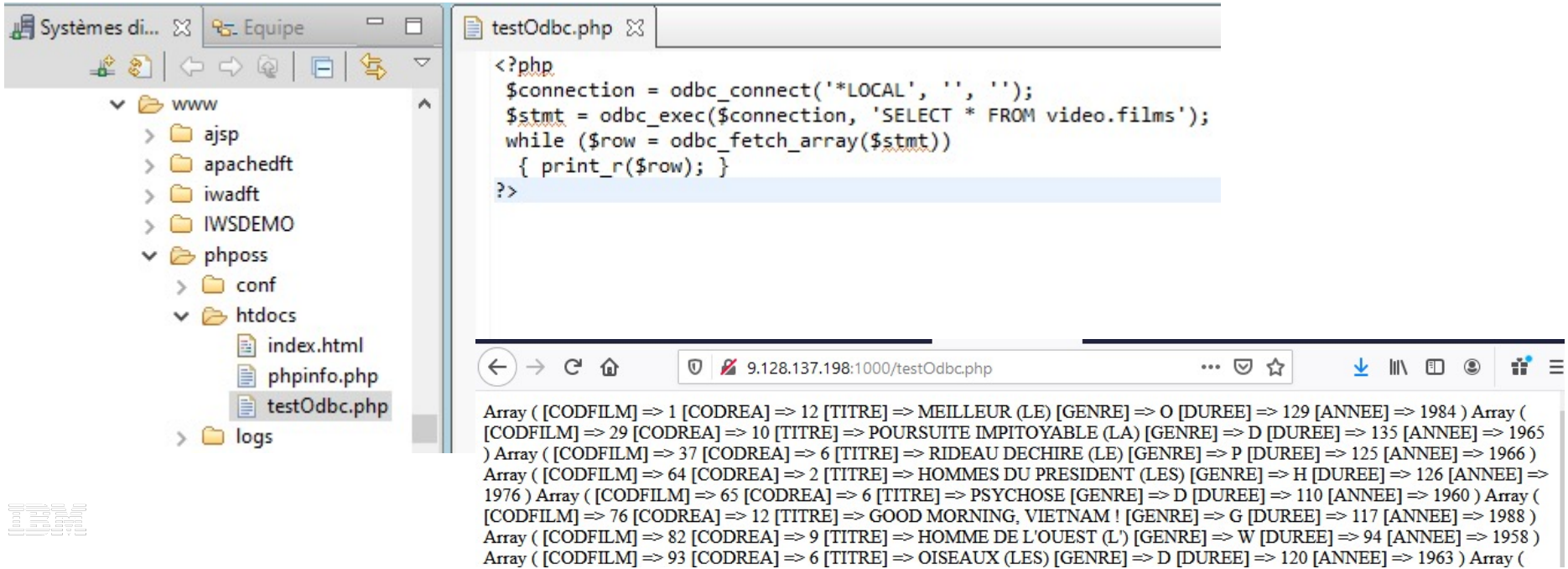
Le PHP communautaire sous IBM i

- Version gratuite Open Source de PHP
  - Basée sur des RPM
- Installation rapide et facile
  - Par YUM, standard de l'industrie (`yum install php-*`)
  - Ou par IBM ACS (Access Client Solutions)
- Mise à jour facile (`yum update / ACS`)
- Serveur Apache ou Nginx
- Accès à DB2 en ODBC
  - Autres possibilités : connecteurs *ibm_db2*, *pdo_ibm* avec la distribution CommunityPlus+ PHP
- Support
  - Gratuit, communautaire
  - Facturable, par IBM TSS : http://ibm.biz/ibmi-oss-support
  - Facturable avec la distribution CommunityPlus+ PHP : https://cfd-innovation.fr/php/community-plus-php/

Installation des modules PHP



Test d'un script PHP avec accès DB2 en ODBC



IBM i

IBM i Anywhere
IBM i Everywhere

4. Base de données PostgreSQL

IBM

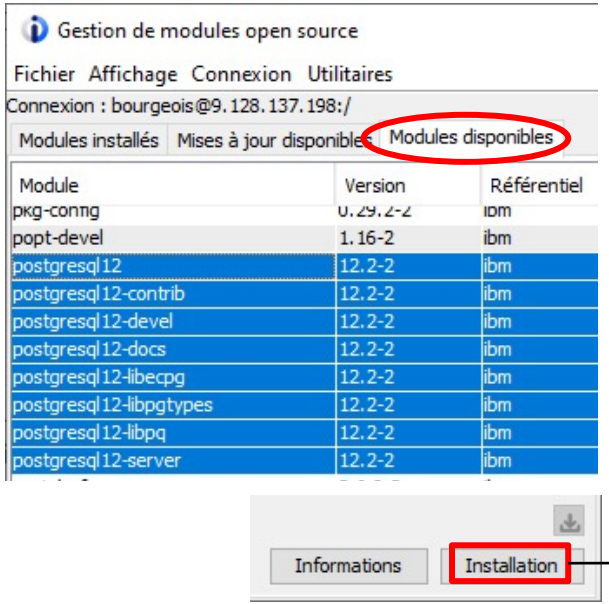
Qu'est-ce que PostgreSQL ?

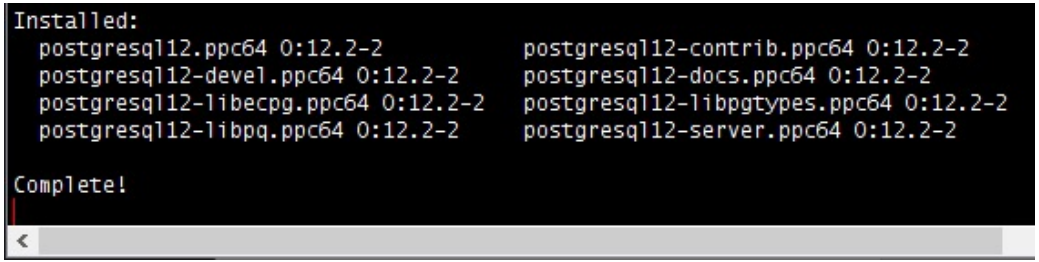
- Base de données **relationnelle** Open Source très largement utilisée

- Accessible à partir des langages Java, PHP, Python, Node.js, Ruby, R, Perl…

- Interfaces
  - psql : mode commande
  - phpPgAdmin : interface graphique Web développée en PHP

Installation





Démarrage


```
-bash-4.4$ pg_ctl start -D /usr/local/postgres -l logfile
waiting for server to start.... done
server started
-bash-4.4$
```

IBM i

IBM i Anywhere
IBM i Everywhere

5. Utilitaires

Utilitaires Open Source sous IBM i

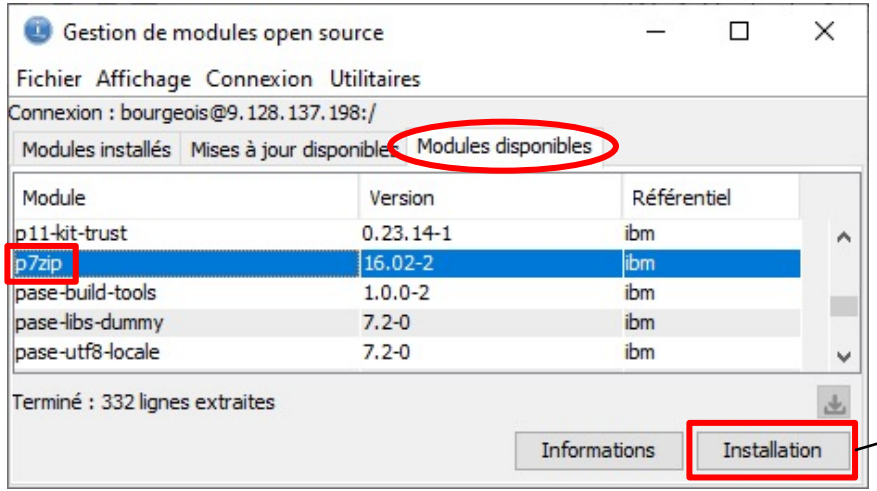
- Rappel – Principaux utilitaires **déjà existants** :
  - **cURL** : récupération de ressources par URL
  - **rsync** : synchronisation de fichiers
  - **lftp** : transfert de fichiers
  - **updatedb** et **locate** : recherche de fichiers
  - **bash** : shell Unix
  - **chroot** : création de bacs à sable
  - **cloud-init** : clonage d'une VM
  - **textinfo** : génération de documentation
  - **ghostscript** : manipulation de PDF
  - **zip, unzip, gzip** : zippage / dézippage

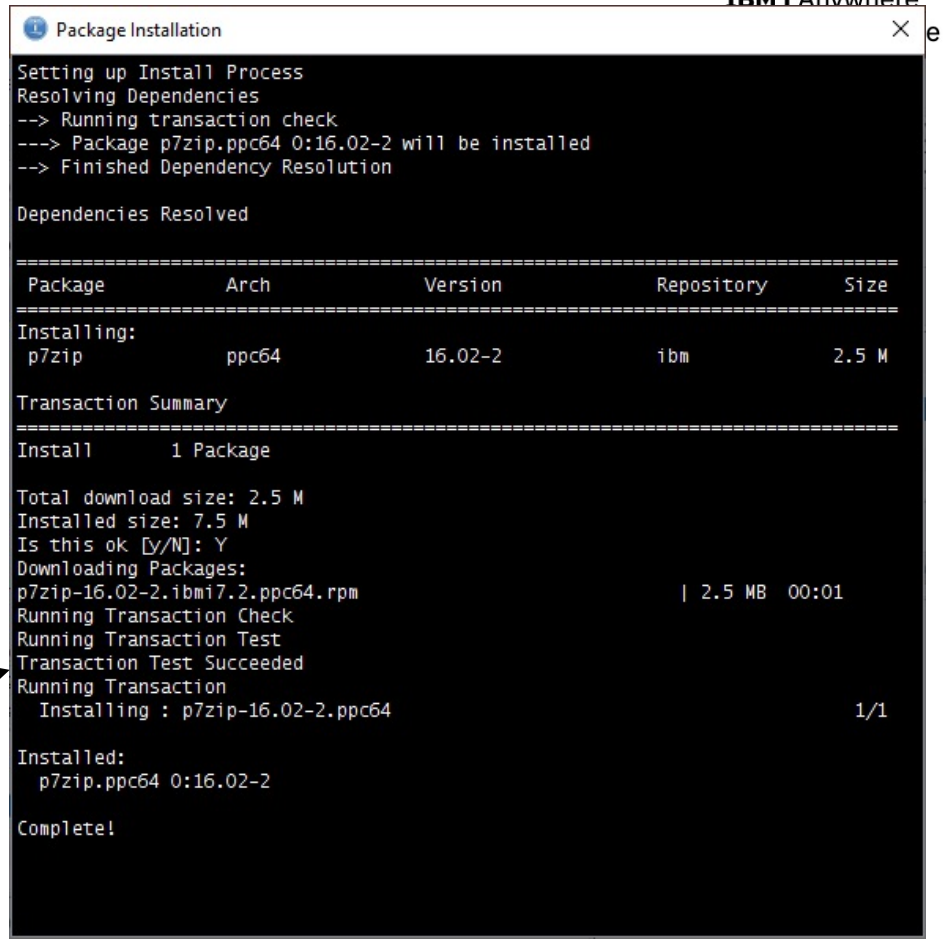
  - … et des dizaines d'autres

Utilitaires Open Source sous IBM i

- Principaux **nouveaux** utilitaires :
  - **7ZIP**
    - Zippage / dézippage
  - **MAN**
    - Système d'aide du monde Unix
  - **ANSIBLE**
    - Automatisation des déploiements de systèmes et d'applications

7Zip – Installation





7Zip – Dans un CL

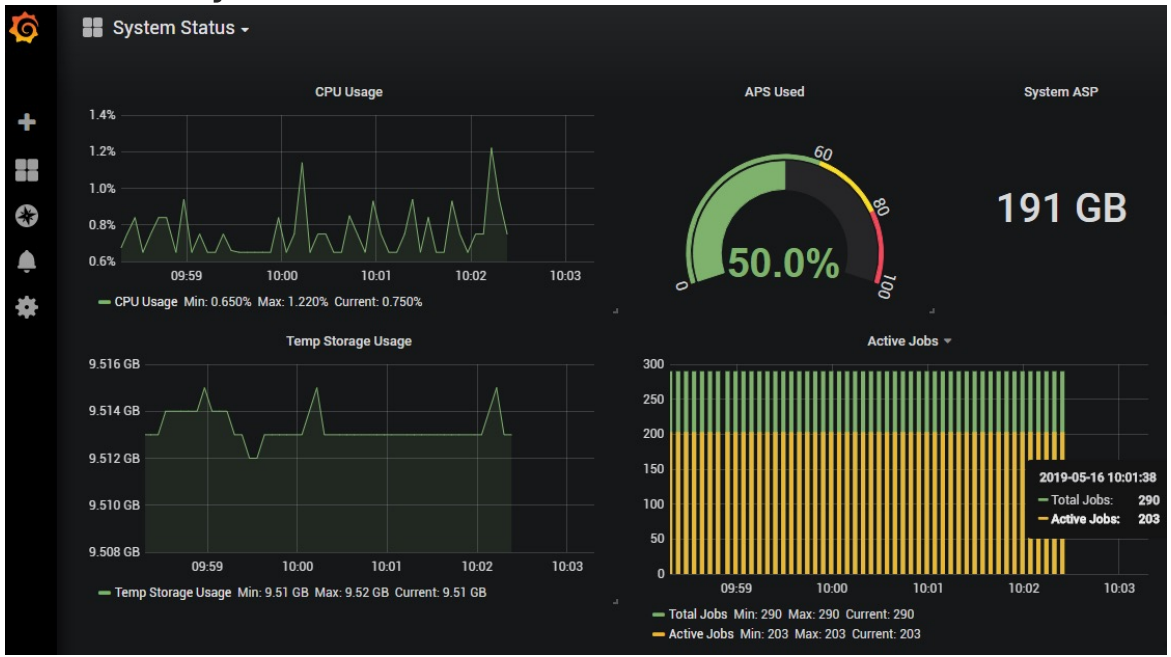

```
        ****************  Début des données  ****************************************
0001.00               QSH         CMD('/qopensys/pkgs/bin/7z x /pb/test.gz +
0002.00                             -o/pb')
        *****************  Fin des données  *****************************************
```

```
call unzip7zip
```

```
   Scanning the drive for archives:
   1 file, 325722 bytes (319 KiB)

   Extracting archive: /pb/test.gz
   --
   Path = /pb/test.gz
   Type = gzip
   Headers Size = 72

   Everything is Ok

   Size:       369963
   Compressed: 325722
   Press ENTER to end terminal session.

 ===> _

 F3=Exit F4=End of File F6=Print F9=Retrieve F17=Top
 F18=Bottom  F19=Left   F20=Right F21=User Window
```

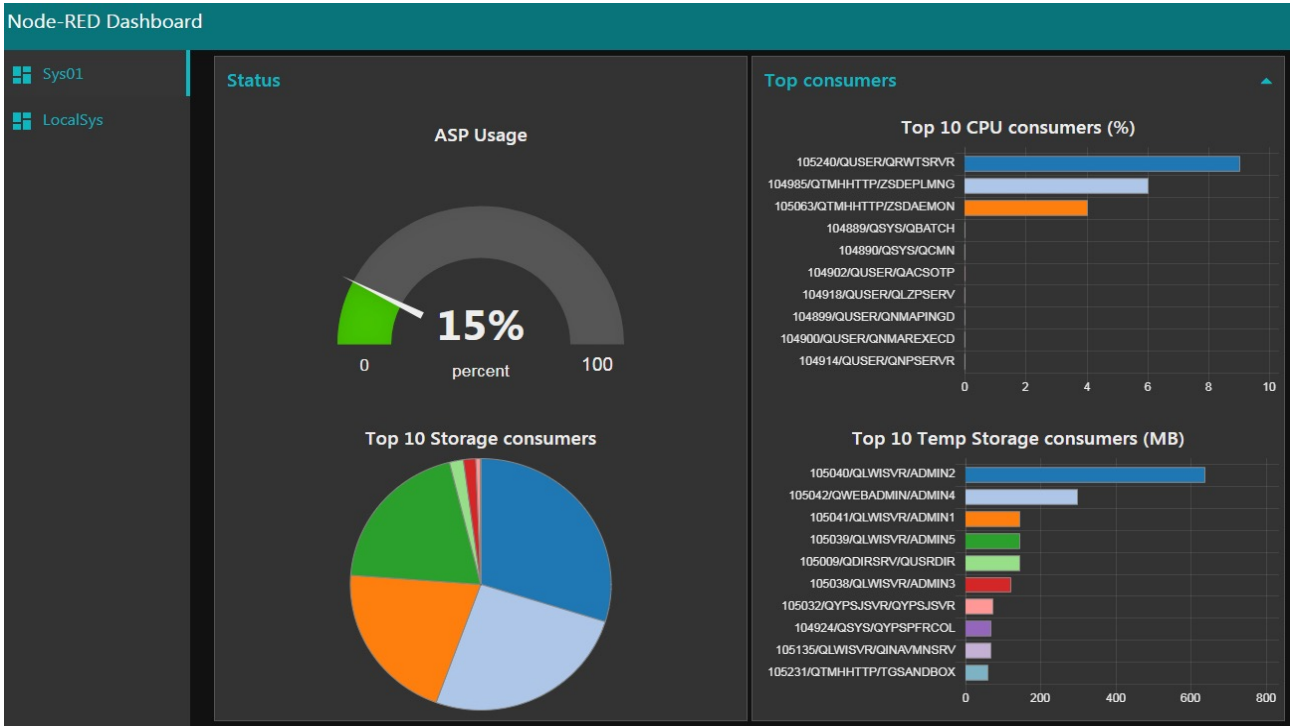
Utilitaires – Exemples IBM i

- Disponibles ici : https://github.com/IBM/ibmi-oss-examples/
- Exemple 1 – Node.js + **Grafana**



Utilitaires – Exemples IBM i

- Exemple 2 – Node.js + **Node-RED**



IBM i

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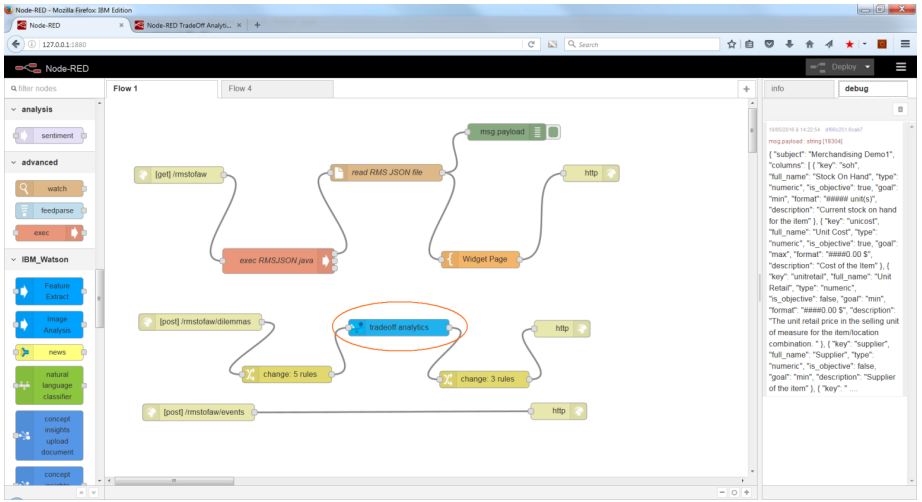
IBM i Everywhere

6. Node-RED

Node-RED

https://nodered.org

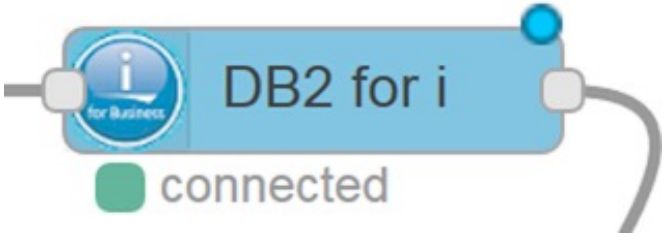
- Node-RED – outil gratuit et open source développé par IBM initialement fait pour l'internet des objets
- Permet de coder graphiquement et rapidement, et de connecter matériels, API, applications ensemble
- Editeur Web - flow editor – contient un grand nombre de nodes dans sa palette évolutive : on trouve tous types de nodes dans un repository en ligne
- Basé sur JavaScript (runtime Nodejs)
- Node-RED est aussi un service IBM Cloud



Node-RED & IBM i

https://flows.nodered.org/node/node-red-contrib-db2-for-i

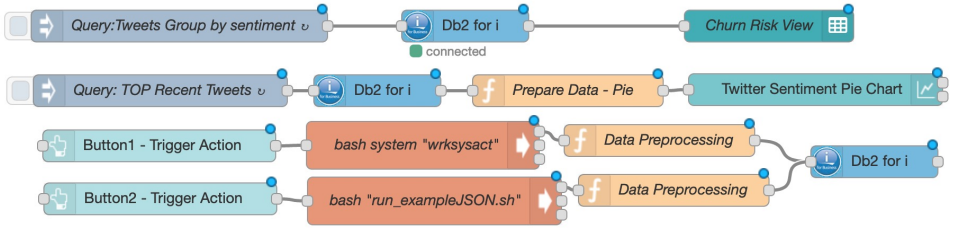
- Noeud Node-RED pour lire et écrire dans une base de données DB2 for i
- Projet Open Source sur GitHub créé en juillet 2017
- Téléchargé 10 000 fois
  - *npm install node-red-contrib-db2-for-i*
- DB2 for i native driver : idb-connector
  - Plan* : odbc mode (portability) , iToolkit node ...
- Utilisé par tous types de solutions (ERP, CRM,...) et développements en Dev/Test et Production

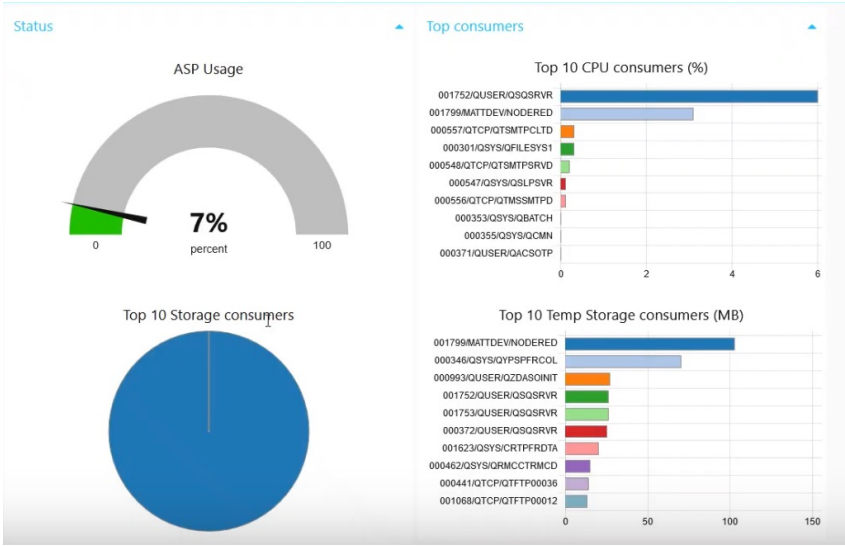


Node-RED & IBM i

Exemple basique

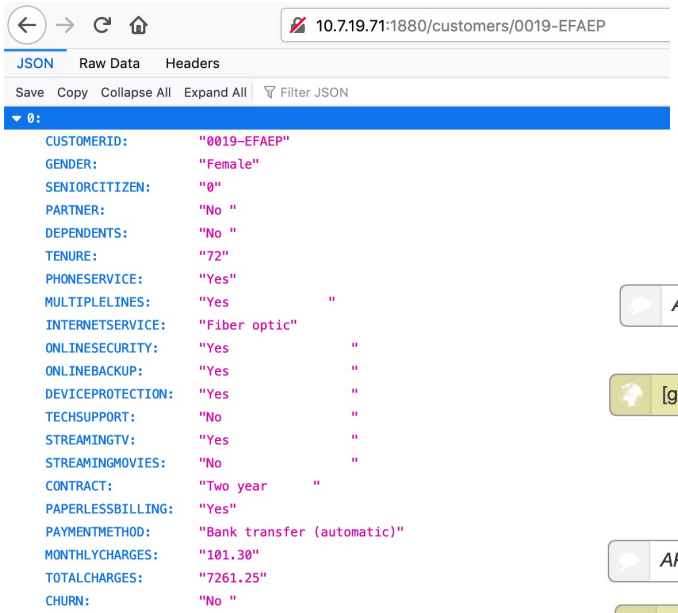
- Requêtes SQL dynamiques
- Utilisation de nodes [node-red-dashboard] afin d'afficher les données et des widgets graphiques sur une interface Web (boutons, graphiques, champs texte, etc.)
- Utilisation de node 'exec' afin d'exécuter des commandes CL / shell (PASE -> ILE)



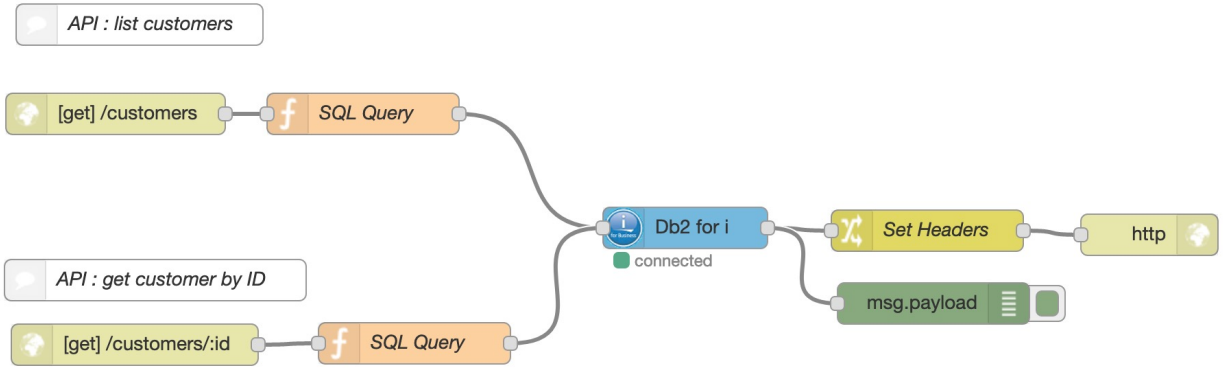


Node-RED & IBM i

Ecrire un Service Web RESTFull en 5 minutes



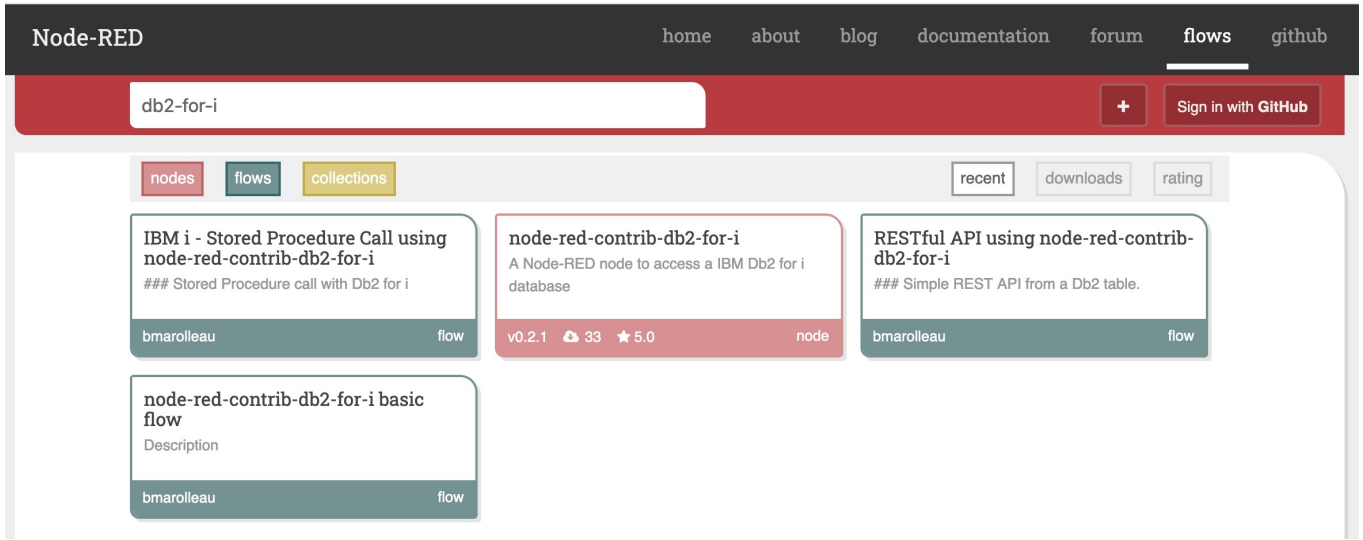
- Utilisation de nodes “http” pour écouter sur un port et passer les paramètres d’entrée (dans l’URL, ou body…)
- Node "DB2 for i" pour executer les requêtes SQL dynamiques
- Contruction de la réponse et réponse HTTP
- Node-RED / Node.js process + DB2 Server job QSQSRVR



Node-RED & IBM i

Comment démarrer ?

- https://github.com/IBM/ibmi-oss-examples/tree/master/nodejs/node-red
- Nodered.org (Nodes à installer et Flows à importer)
- Exemples sur IBM Developer : Premier flow avec Db2 for i , Helpdesk Chatbot



IBM i

IBM i Anywhere
IBM i Everywhere

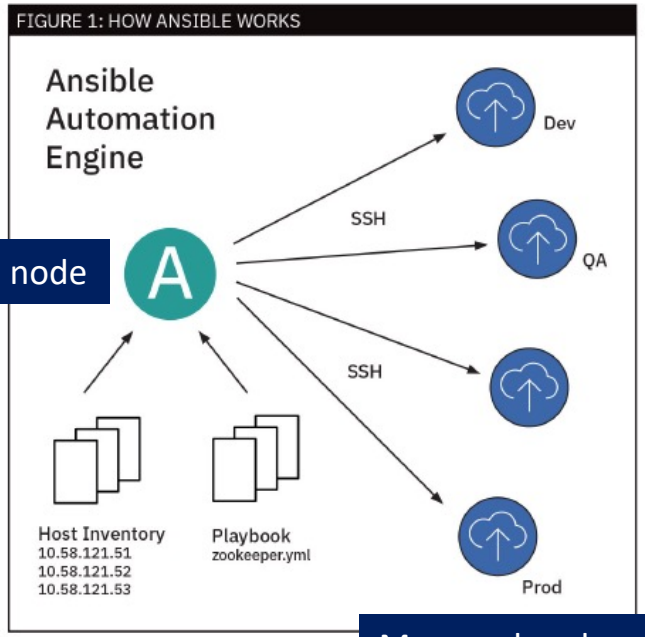
7. Ansible

Ansible – Introduction

- Ansible est une plateforme d'automatisation qui facilite le déploiement des applications et systèmes
  - C'est une application Open source
  - Agent-less – Pas besoin d'installation et de gestion d'agents
  - Basé sur Python / YAML
  - Grande flexibilité et gestion de la configuration des systèmes
  - Rétablissement de la configuration en cas d'erreur

- Il prend en charge la gestion de la configuration :
  - Configuration des serveurs
  - Déploiement d'applications
  - Intégration continue / Test continu (CI / CD)
  - Provisioning
  - Orchestration
  - Automatisation des tâches

Ansible – Terminologie



Control node

Managed nodes

Control node – any machine with Ansible installed and is used to run playbooks

Managed node (a.k.a. endpoints) – endpoint devices (e.g., AIX, IBM i, Linux, Windows, etc.) that are managed with Ansible

Inventory – a list of managed nodes so that Ansible understands the overall IT landscape

Modules – units of code that Ansible executes; hundreds of modules provided out-of-box; thousands of community modules also available

Tasks – units of action in Ansible (invoke a set of modules to do something useful)

Playbooks – ordered list of tasks and written in YAML

Plugins – modules complémentaires aux modules de base (extensions)

Rôles – composants réutilisables et autonomes à intégrer dans les playbooks

IBM i Anywhere
IBM i Everywhere

Ansible pour IBM i – Cas d'usage

- Tâches d'administration
  - Téléchargement et installation de PTF
  - Déploiement de programmes et d'applications
  - Installation de modules open source
  - Gestion des travaux, de la sécurité
  - Exécution de tâches spécifiques par commandes CL et scripts SQL
- Tâches de développement
  - Intégration continue, automatisation des builds…
  - Déploiement d'un environnement applicatif Dev > Test > QA > Prod
- Tâches Cloud
  - Clonage / provisionnement de VM et déploiement dans le Cloud (public / privé)
- Vérification de conformité de configuration et de sécurité
  - Vérification d'attributs système, de droits, de profils utilisateur…

Ansible pour IBM i – Quelques exemples de **modules**

ibmi_at	Schedule a batch job on a remote IBMi node.
ibmi_cl_command	Executes a CL command.
ibmi_copy	Copy a save file from local to a remote IBMi node.
ibmi_display_subsystem	Display all currently active subsystems or currently active jobs ir a subsystem.
ibmi_end_subsystem	End a subsystem.
ibmi_fetch	Fetch objects or a library from a remote IBMi node and store on local.
ibmi_install_product_from_savf	Install the the licensed program(product) from a save file.
ibmi_lib_restore	Restore one library on a remote IBMi node.
ibmi_lib_save	Save one libary on a remote IBMi node.
ibmi_object_authority	Grant, Revoke and Display the Object Authority.
ibmi_object_restore	Restore one or more objects on a remote IBMi node.
ibmi_object_save	Save one or more objects on a remote IBMi node.
ibmi_reboot	Reboot IBMi machine.
ibmi_save_product_to_savf	Save the the licensed program(product) to a save file.
ibmi_script	Execute a local cl/sql script file on a remote ibm i node.
ibmi_script_execute	Execute a cl/sql script file on a remote ibm i node.
ibmi_sql_execute	Executes a SQL non-DQL(Data Query Language) statement.
ibmi_sql_query	Executes a SQL DQL(Data Query Language) statement.
ibmi_start_subsystem	Start a subsystem.
ibmi_sync	Synchronize a save file from current ibm i node A to another ibm i node B.
ibmi_synchronize	Synchronize a save file from ibm i node A to another ibm i node B.
ibmi_uninstall_product	Delete the objects that make up the licensed program(product).
ibmi_user_and_group	Create, Change and Display a user(or group) profile.
ibmi_device_vary	Vary on or off target device on a remote IBMi node
ibmi_host_server_service	Manage host server on a remote IBMi node
ibmi_tcp_server_service	Manage tcp server on a remote IBMi node
ibmi_iasp	Control IASP on target IBMi node
ibmi_message	Search message on a remote IBMi node
ibmi_fix	Load from save file, apply, remove or query PTF(s).
ibmi_fix_imgclg	Install fixes from virtual image.
ibmi_job	Returns job information per user request.
ibmi_object_find	Find specific IBM i object(s).
ibmi_submit_job	Submit an IBM i job.
ibmi_tcp_interface	Manage IBM i tcp interface. You can add, remove, start, end or query a tcp interface.

Ansible pour IBM i – Quelques exemples de **playbooks** et **rôles**

Playbooks

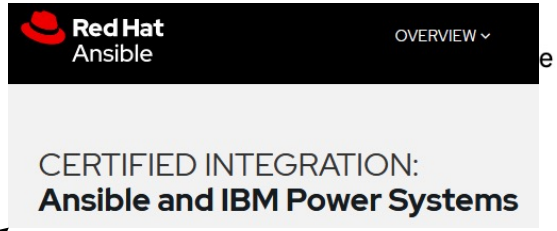
- enable-ansible-for-i
- enable_offline_ibmi
- ibmi-install-nodejs
- hosts_ibmi.ini
- ibmi-check-default-passwords.yml
- ibmi-cl-command-sample.yml
- ibmi-fix-group-check.yml
- ibmi-fix-repo-cum-package.yml
- ibmi-fix-repo-download-status.yml
- ibmi-fix-repo-ptf-group.yml
- ibmi-fix-repo-single-ptf.yml
- ibmi-sql-sample.yml
- ibmi-sqlite3-sample.yml
- ibmi-sysval-sample.yml
- query-iasp-sample.yml
- ssh-addkey.yml

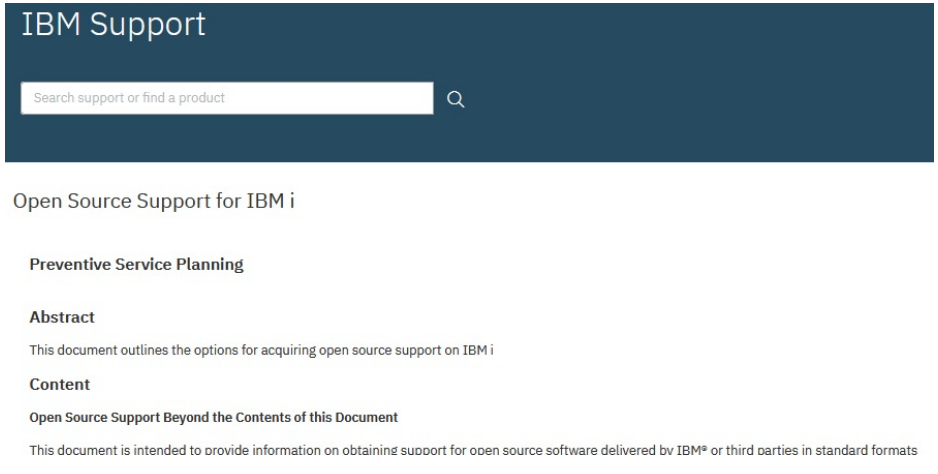
Rôles

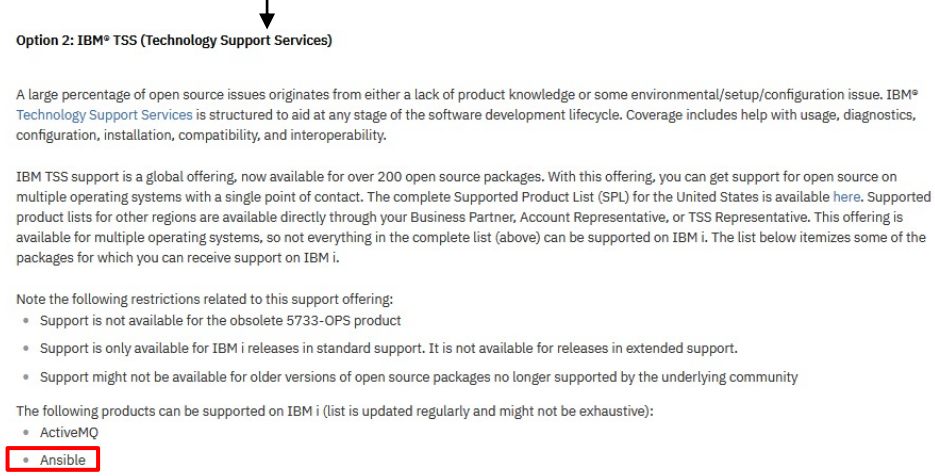
- apply_all_loaded_ptfs
- apply_ptf
- capture_server_via_powervc
- change_server_state_via_powervc
- check_ptf
- check_ptf_groups_against_fix_repo
- check_ptfs_by_product_against_fix_repo
- configure_passwordless_ssh_login
- deploy_vm_via_powervc
- display_network_info_via_powervc
- display_vm_info_via_powervc
- download_individual_ptfs
- fix_repo_check_download_individual_ptfs
- fix_repo_check_ptf_group
- fix_repo_download_add_ptf_group
- fix_repo_download_apply_individual_ptfs
- fix_repo_extract_ptf_group_info
- load_apply_ptfs
- load_ptf
- present_ip_interface
- sync_apply_individual_ptfs
- sync_apply_ptf_group

Ansible pour IBM i – Support

- Modules ansible IBM i installés
  - Sur un serveur Linux x86
    - Support gratuit (communautaire) ou facturable (Red Hat)
  - Sur un serveur IBM i
    - Support gratuit (communautaire) ou facturable (**IBM**)

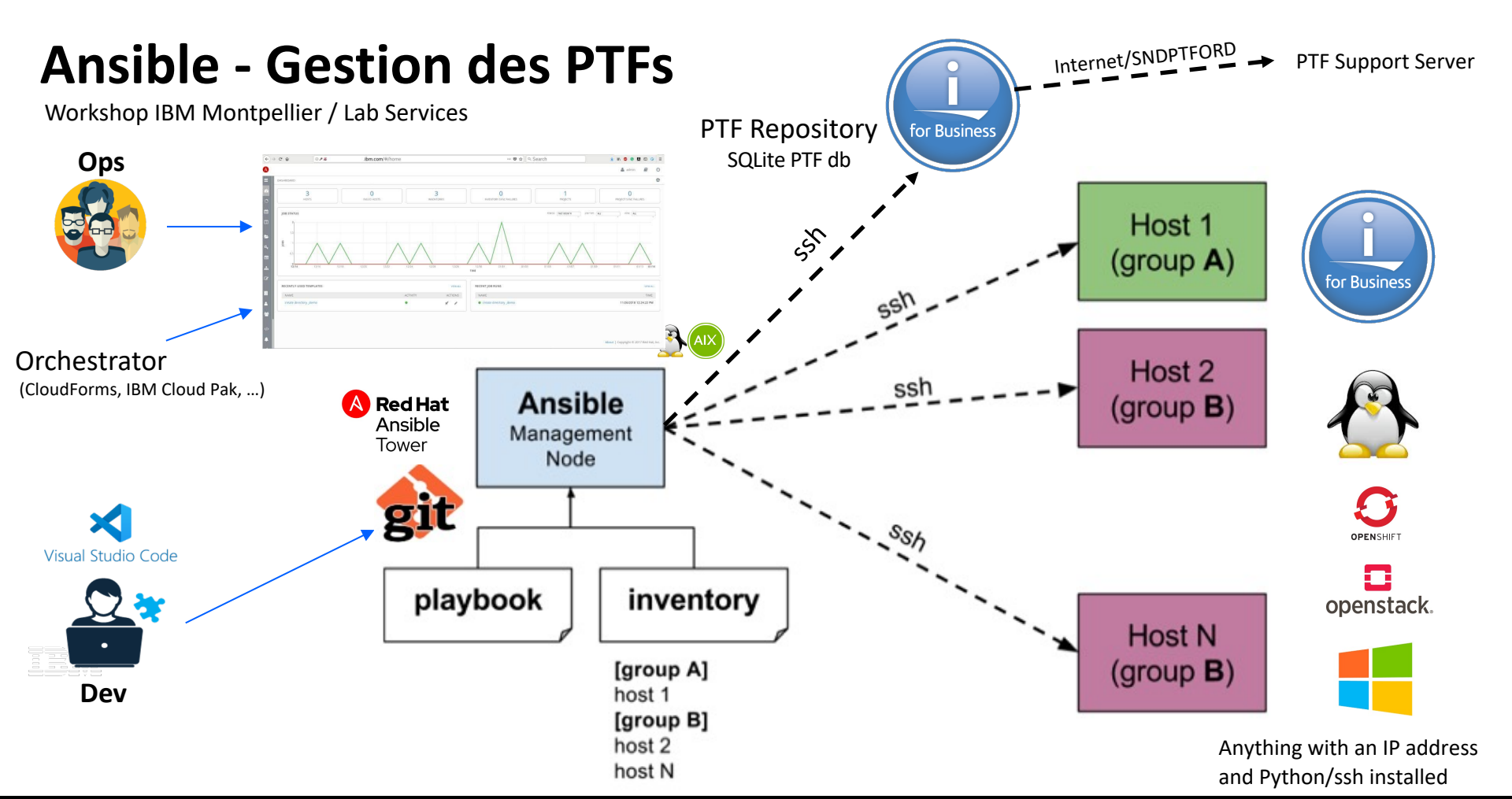






Ansible - Gestion des PTFs

Workshop IBM Montpellier / Lab Services



Ansible Tower

Red Hat Ansible Tower

IBM i

Ansible Tower = Supported Ansible solution for Enterprise

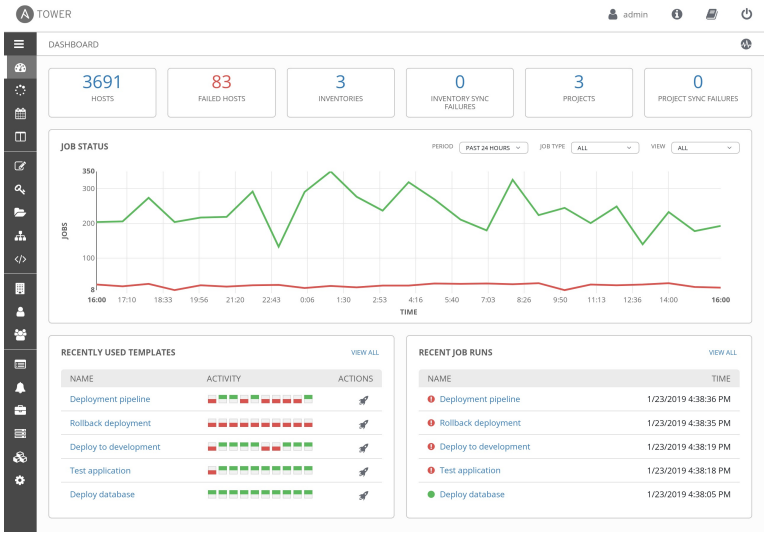
YOUR ANSIBLE DASHBOARD

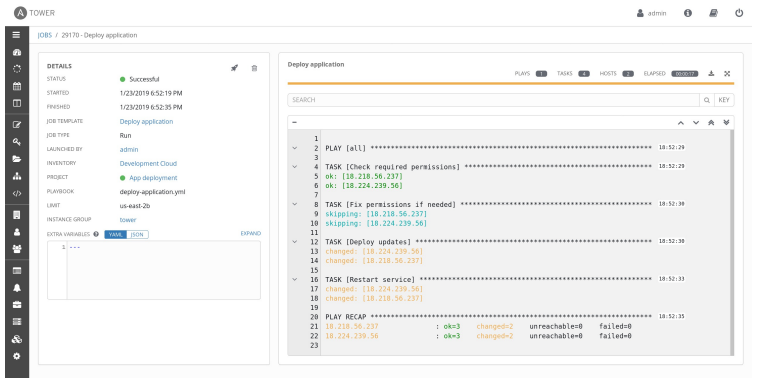
REAL-TIME JOB STATUS UPDATES

MULTI-PLAYBOOK WORKFLOWS

WHO RAN WHAT JOB WHEN

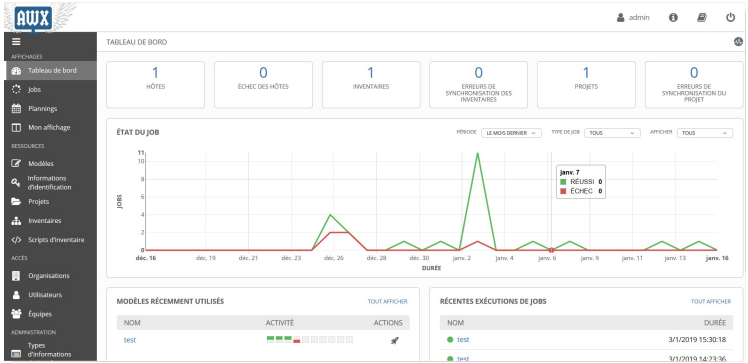
SUPPORT IBM i TASKS



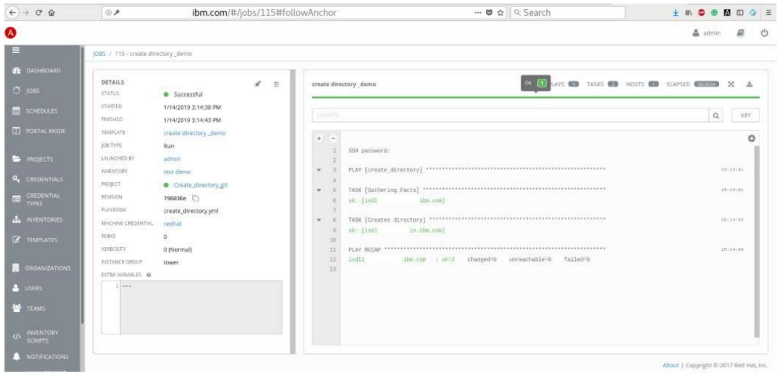


Ansible AWX

https://github.com/ansible/awx



Ansible Tower upstream project. Community Support



YOUR ANSIBLE DASHBOARD

REAL-TIME JOB STATUS UPDATES

MULTI-PLAYBOOK WORKFLOWS

WHO RAN WHAT JOB WHEN

SUPPORT IBM i TASKS

https://developer.ibm.com/technologies/systems/articles/automation-using-ansible-awx-gui/
https://www.power-devops.com/post/installing-ansible-awx-on-ibm-aix

IBM i

IBM i Anywhere
IBM i Everywhere

8. Kafka & Camel

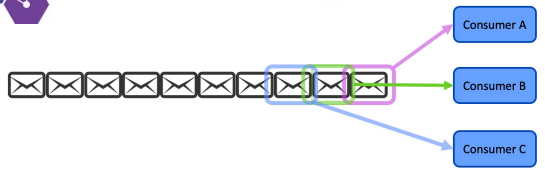
Interopérabilité & Intégration ?

ActiveMQ & Kafka

Disponibles sur IBM i, gratuit, Open Source sous licence Apache 2.0

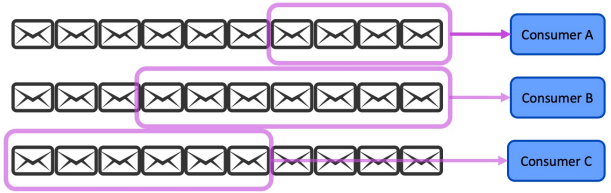
- Apache **ActiveMQ** : implémentation JMS
  - Fédération de systèmes & Intégration asynchrone
  - Message Broker supportant divers protocoles : AMQP, MQTT, etc.

Apache ACTIVEMQ



- Apache **Kafka** : high-throughput streaming event engine
  - Conçu par LinkedIn, Scalable++, pour traiter des grands volumes de données
  - S'intègre facilement avec Camel…
  - Streaming = on traite **plusieurs** lots/ séries de données à la fois

kafka



Kafka – Architecture

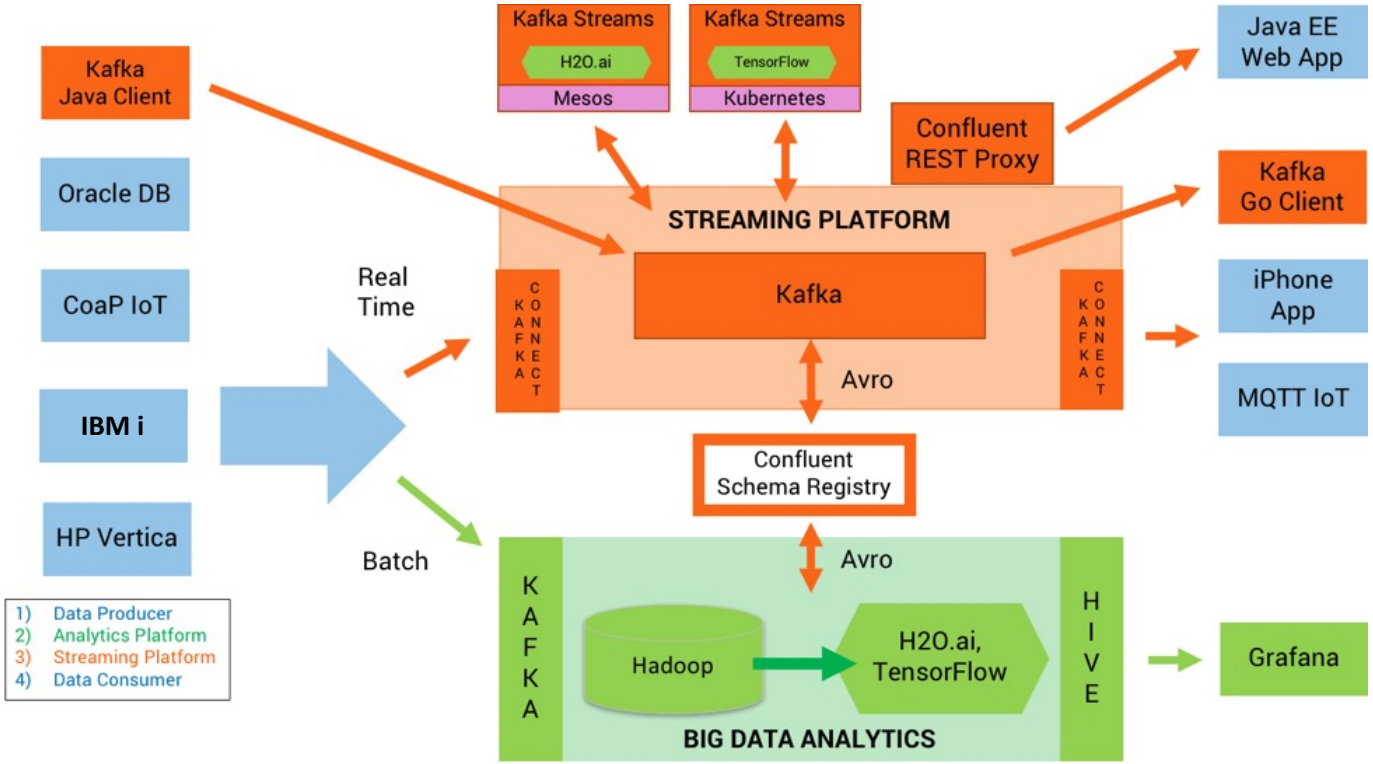


Image source: https://www.confluent.io/blog/build-deploy-scalable-machine-learning-production-apache-kafka/

Kafka sur IBM i

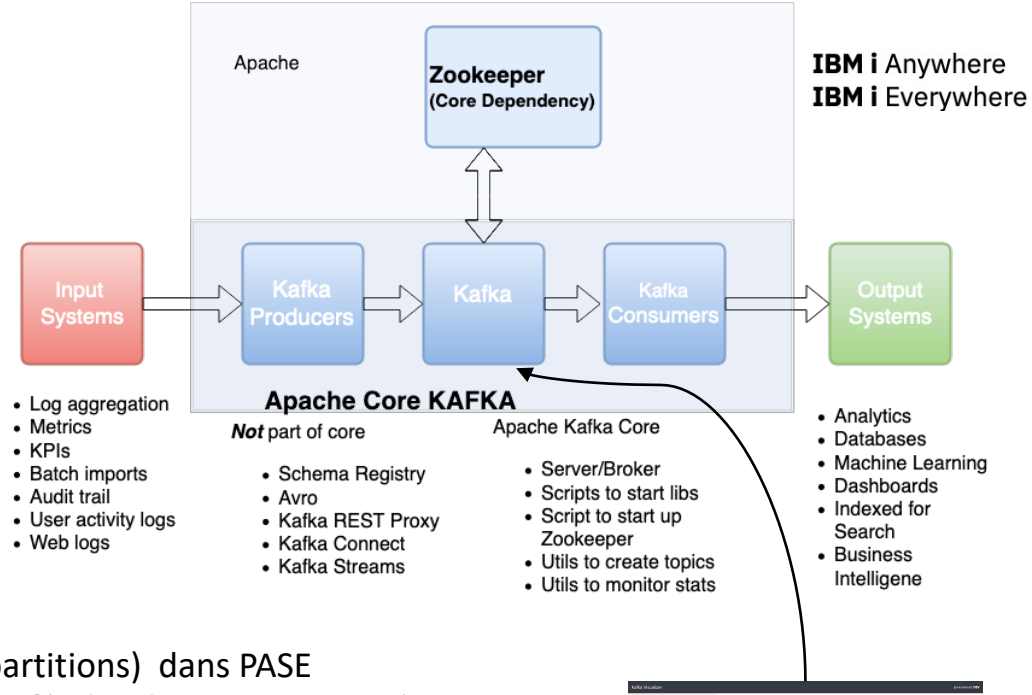
Basé sur Java, tout comme Apache Camel
Kafka Client existe aussi en Node.js….

// **Prérequis :** JVM (Openjdk11…)

```
# yum install wget ca-certificates-mozilla
gzip tar-gnu openjdk-11 coreutils-gnu sed-
gnu grep-gnu
```

// **Installation du produit (téléchargement)**

```
#  wget
https://apache.osuosl.org/kafka/2.6.0/k
afka_2.13-2.6.0.tgz
```



// **Démarrage Zookeeper** (coordination vs. Brokers & partitions) dans PASE

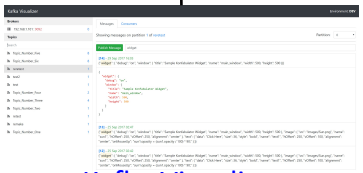
```
# kafka/bin/zookeeper-server-start.sh  kafka/config/zookeeper.properties
```

// **Démarrage du serveur** (Broker) dans PASE

```
# kafka/bin/kafka-server-start.sh  kafka/config/server.properties
```

// **Test avec un producteur** (ici Application Java) publiant sur un topic “my-topic”

```
# kafka/bin/kafka-console-producer.sh  --broker-list localhost:9092  --topic my-topic
```



Kafka Visualizer
(Graphique)

Kafka, Camel : Service Commander

- Gérer les services IBM i facilement :

```
bash-4.4$ sc check all
  RUNNING                 | as-database (System *DATABASE Host Server)
  NOT RUNNING             | ftp (System FTP server)
  NOT RUNNING             | zookeeper (Apache Zookeeper Server using OpenJDK)
  NOT RUNNING             | kafka (Apache Kafka bootstrap server)
  RUNNING                 | as-central (System *CENTRAL Host Server)
  RUNNING                 | navigator (IBM Navigator for i)
  NOT RUNNING             | kafkaviz (Apache Kafka Visualizer)
  RUNNING                 | gitbucket (GitBucket git web platform)

bash-4.4$ sc start kafka
Performing operation 'START' on service 'kafka'
Attempting to start service dependency 'zookeeper' (Apache Zookeeper Server using OpenJDK)...
Service 'Apache Zookeeper Server using OpenJDK' successfully started
For details, see log file at: /home/JGORZINS/.sc/logs/2021-03-12T13:23:31.093-0500.zookeeper.log
Service 'Apache Kafka bootstrap server' successfully started
For details, see log file at: /home/JGORZINS/.sc/logs/2021-03-12T13:23:31.086-0500.kafka.log
```

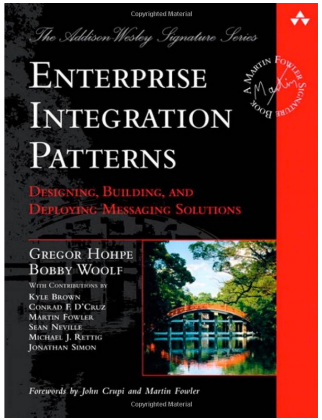
- Exemples, code, vidéo : https://github.com/ThePrez/ServiceCommander-IBMi

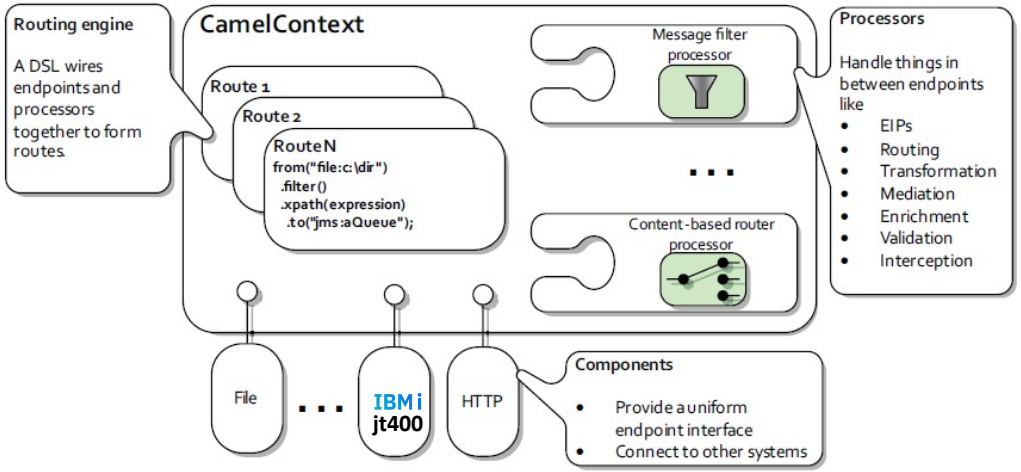
Qu’est ce que Camel ?

Couteau Suisse de l’intégration, disponible sur IBM i

- Projet Open Source Apache fondé sur les “Enterprise Integration Patterns” (EIP)
- Centré autour de 60+ patterns que l’on rencontre dans des projets “Enterprise integration”
- Fournit un langage afin d’implémenter ces patterns (style UNIX pipeline)

APACHE Camel

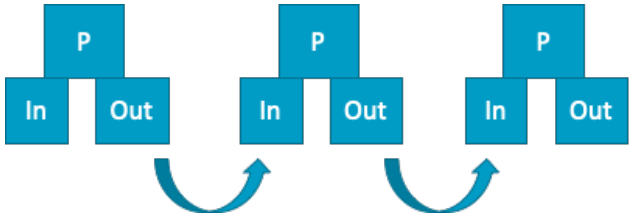




Qu’est ce que Camel ?

IBM i Anywhere
IBM i Everywhere

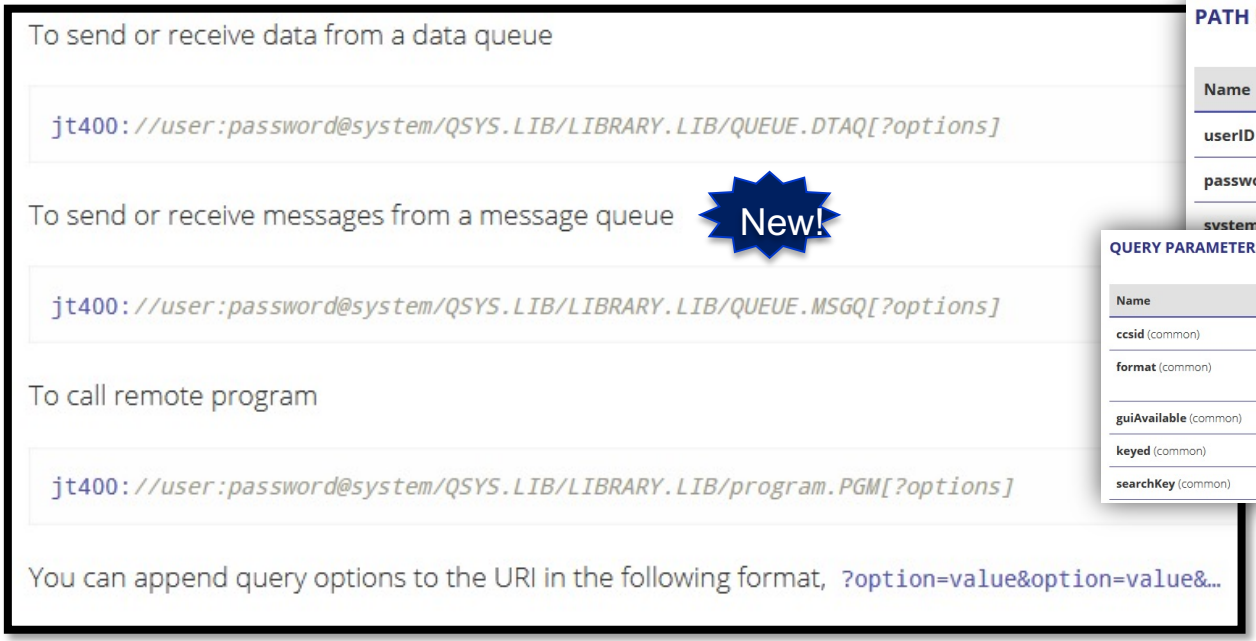
- Librairies Java ➔ Une application Camel est une application Java
  D’autres langages peuvent être utilisés pour décrire des « Expressions »
- Prérequis : JVM sur IBM i (JV1, Openjdk etc.)
- Camel utilise une concaténation répétable et normalisée d’objets “Processor” et de ”Messages” groupés dans un ensemble appelé “Exchange”
  - Message "In"
  - ”Processor"
  - Message "Out”



- Note : Camel peut être considéré comme un Node-RED en version programmatique Java : simple, beaucoup de connecteurs, passe-plat entre applications

Synergie entre IBM i et Apache Camel

- Documentation : Apache Camel Component
  https://camel.apache.org/components/latest/jt400-component.html



PATH PARAMETERS (5 PARAMETERS):

Name	Description
userID	**Required** Returns the ID of the IBM i user.
password	**Required** Returns the password of the IBM i user.
systemName	**Required** Returns the name of the IBM i system.

QUERY PARAMETERS (33 PARAMETERS):

Name	Description
ccsid (common)	Sets the CCSID to use for the connection with the IBM i system.
format (common)	Sets the data format for sending messages. There are 2 enums a binary
guiAvailable (common)	Sets whether IBM i prompting is enabled in the environment run
keyed (common)	Whether to use keyed or non-keyed data queues.
searchKey (common)	Search key for keyed data queues.

Camel

Exemple : Bridge Data Queue vers Kafka

- In, Process, Out – Avec URI spécifiques
- Cas d'usage : stream de transactions DB2 vers Apache Kafka

```
final String dtaqUri = conf.getDtaQUri(); //something like -> jt400://username:password@localhost/qsys.lib/mylib.lib/myq.DTAQ?keyed=false&format=binary&guiAvailable=false
final String kafkaUri = conf.getKafkaUri(); //something like -> kafka:mytopic?brokers=mybroker:9092
context.addRoutes(new RouteBuilder() {
    @Override
    public void configure() {
        from(dtaqUri)
        .wireTap("log:msgq_to_email?showAll=true&level=INFO") // This is just for debugging data flowing through the route
        .to(kafkaUri);
    }
});
```

Améliorations DB2 utiles avec Apache Camel

- Les fonctions SQL de publication JSON renvoient les données d'une façon comprehensible pour les consommateurs Kafka/ActiveMQ

```
SELECT JSON_OBJECT(
     KEY 'Department' VALUE
     JSON_ARRAYAGG(JSON_OBJECT(
                KEY 'Id' VALUE X.DEPTNO,
                KEY 'Name' VALUE X.DEPTNAME)))
                AS DEPT_JSON
   FROM TOYSTORE.DEPT X;
```

```
call qsys2.send_data_queue_utf8(
    message_data       => scottf.dq_json,
    data_queue         => 'HANDOFF_DQ',
    data_queue_library => 'BANKONOSS');
```

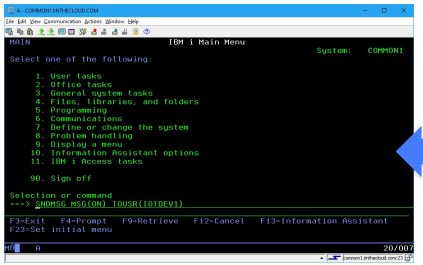
- Les fonctions SQL de gestion des Data Queue permettent une integration avec les files d'attente (ainsi qu'Apache Camel) directement depuis la base de données

Exemple d'usage

Robustesse & Standardisation

IBM i & Internet of Things

IBM i SNDMSG Command



*MSGQ

Camel

APACHE ACTIVEMQ

Connected Device

IBM i & Real time AI predictions

Db2 for i

Trigger

*DTAQ

Camel

kafka

AI Inference

Predictive Model
Machine Learning

Kafka, Camel, Comment démarrer?

- Exemples "IBM i OSS" https://github.com/IBM/ibmi-oss-examples/
  - Dossier « Camel »
  - Bridge entre data queue & Kafka (Db2->Kafka bridge)
    - Nécessite Kafka
  - Bridge Message queue to email
    - Nécessite un SMTP server
  - Monitoring Disque avec email
    - Nécessite un SMTP server
  - Monitoring Disque avec message queue
    - envoi de messages via message queue *SYSOPR

- Workshop Camel / Kafka en ligne:
  - https://github.com/ThePrez/FOCUS2020-Workshop/

Support Open Source par IBM TSS

Exemples IBM i

- Git
- Jenkins
- Rsync
- **Ansible**
- **Node.js**
- PHP
- Apache Tomcat
- WordPress
- Python
- R
- **Apache ActiveMQ**
- **Apache Camel**
- **Apache Kafka**
- **Apache Zookeeper**

http://ibm.biz/ibmi-oss-support

IBM i

IBM i Anywhere
IBM i Everywhere

9. IBM i – Next Gen Apps, Cloud, Containers

IBM Power Community

Connect, learn, share, and engage with the IBM Power Community.

Steve Will

https://community.ibm.com/community/user/power/blogs/steven-will1/2021/02/26/you-and-i-ibm-i-and-cloud

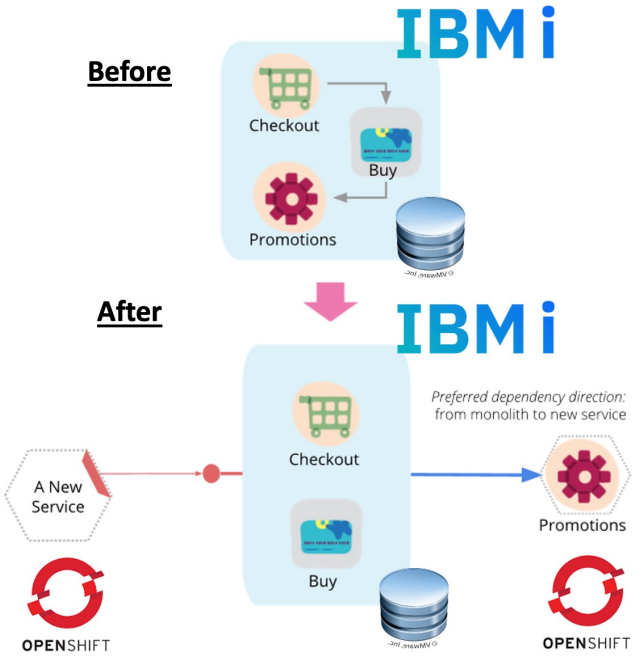
IBM i Next Gen Apps Presentation (Oct 2021)

IBM

Application Modernization Journey

Extending Traditional Apps with Cloud Native

1. Take benefits of DB2 for i & SQL – unrivalled Performance/Security/Reliability
2. Get rid of RPG code from the 90's and use modern IDE's
3. Develop with today's languages
   - RPG Free , Open Source stack on IBM i
4. Expose existing logic with standard protocols & connectors
5. Use POWER9 & Power10 capabilities
   - CoD, Power Private Cloud, IaaS Power Virtual Server on IBM Cloud
6. Explore solutions available on the platform – Open Source
   - IoT , Analytics (Web Query) & AI (ML on IBM i/Db2 for i), DevOps & Automation…
7. Need Cloud Native technologies you don't find (yet) on IBM i ?
   1. Integration with **Red Hat OpenShift Container Platform (OCP)**
   2. Need full support on containerized middleware? IBM Cloud Paks on OCP



Inspiring examples on [IBM i Stories]

Application Modernization Journey

Extending Traditional Apps with Cloud Native

OPENSHIFT

Stateless & Distributed Front-end Apps

Unleash: Build new cloud-native solutions

OpenShift : Enterprise Kubernetes for Cloud Native

✓ OCP on Power: 2.5 X more container density vs. x86 and Unequaled Reliability
✓ IBM Cloud Pak for Apps for easy Re-platforming & DevOps

IBM i

Stateful & Transactional Apps

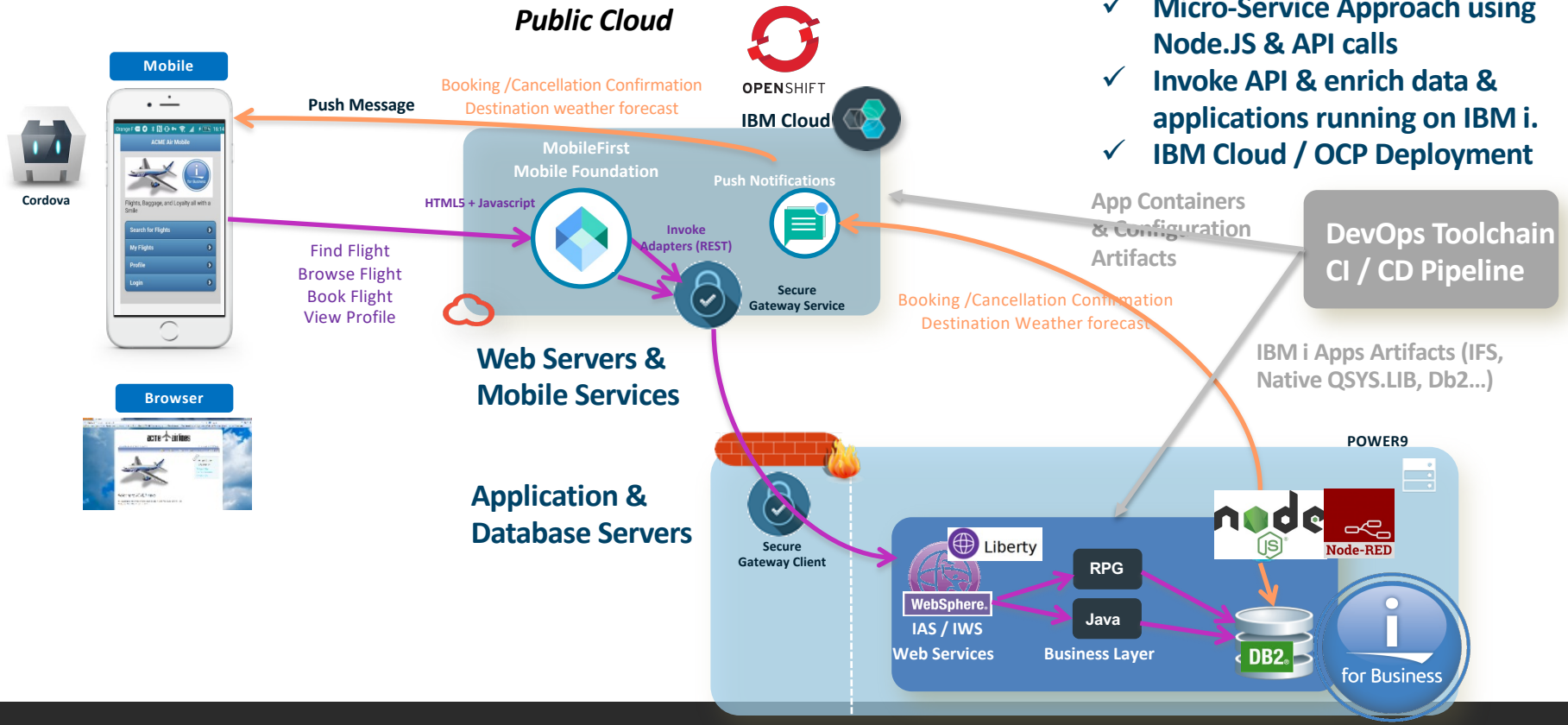
Unlock: Modernize and leverage existing investments

IBM i : Unrivaled Application & Database Server

✓ Real time replication w/ **PowerHA**
✓ Zero downtime with **Db2 Mirror for i**
✓ Maximum Resilience, Security (CVS Reports)
✓ Modernize and Expose existing Business Logic (RPG, COBOL, Node.js, Python etc.)

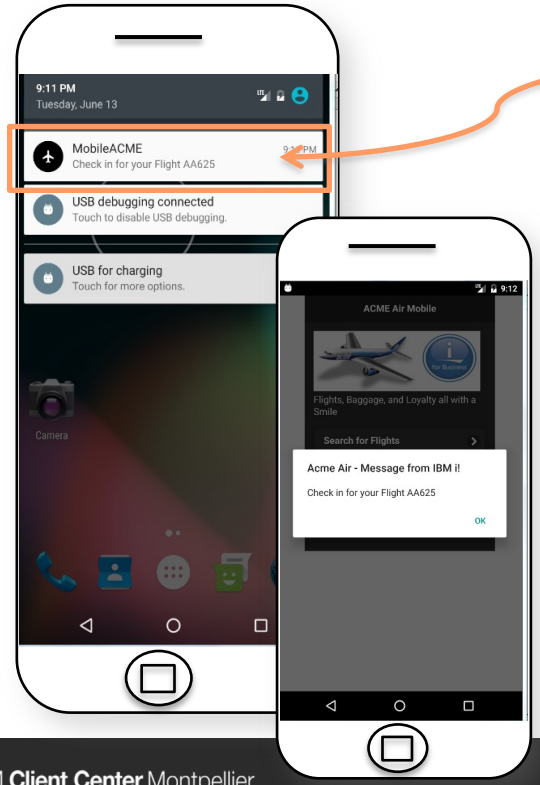
Modernization Examples : Application Modernization on IBM i

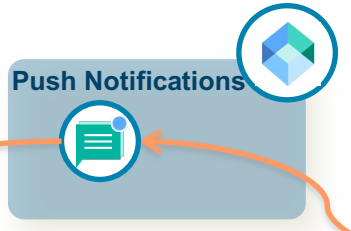
Hybrid Application – DevOps & Microservices



- ✓ **Micro-Service Approach using Node.JS & API calls**
- ✓ **Invoke API & enrich data & applications running on IBM i.**
- ✓ **IBM Cloud / OCP Deployment**

Interact with ~~Mobile users~~ your Customers from IBM i





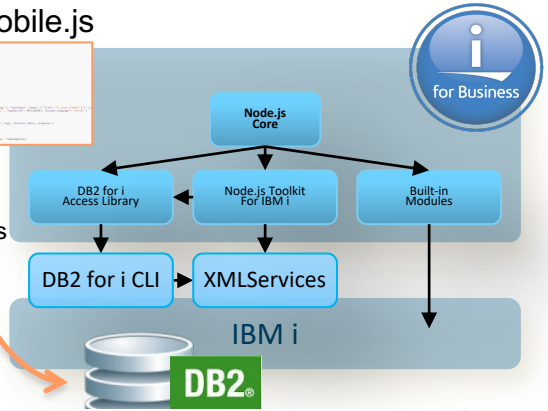
IBM Cloud Push Service
Or
MobileFirst Push Service

REST

HTTPS

acme-mobile.js

Check every 30 seconds



- ✓ **Micro-Service Approach using Node.JS & API calls**
- ✓ **Invoke API & enrich data & applications running on IBM i. Easy & Secure.**
- ✓ **Use Cases: Weather API, Watson API, Mobile API….innovation without limits**

ID	CUSTOMERID	MESSAGE	STATUS
10	-	-	sent
11	uid0@email.com	ACME AIR Reservation for Flight AA49 confirmed	sent
12	uid0@email.com	ACME AIR Reservation for Flight AA49 cancelled	sent
13	uid0@email.com	ACME AIR Reservation for Flight AA49 confirmed	sent
14	uid0@email.com	ACME AIR Reservation for Flight AA49 confirmed	sent
15	uid0@email.com	ACME AIR Reservation for Flight AA49 confirmed	sent
16	uid0@email.com	ACME AIR Reservation for Flight AA49 cancelled	sent
17	uid0@email.com	ACME AIR Reservation for Flight AA49 cancelled	sent

Events table populated by any program on IBM i

Ex: DB2 Trigger inserts a line when a user is booking

Interact with ~~Mobile users~~ your Customers from IBM i

Ex: pushMessage.js

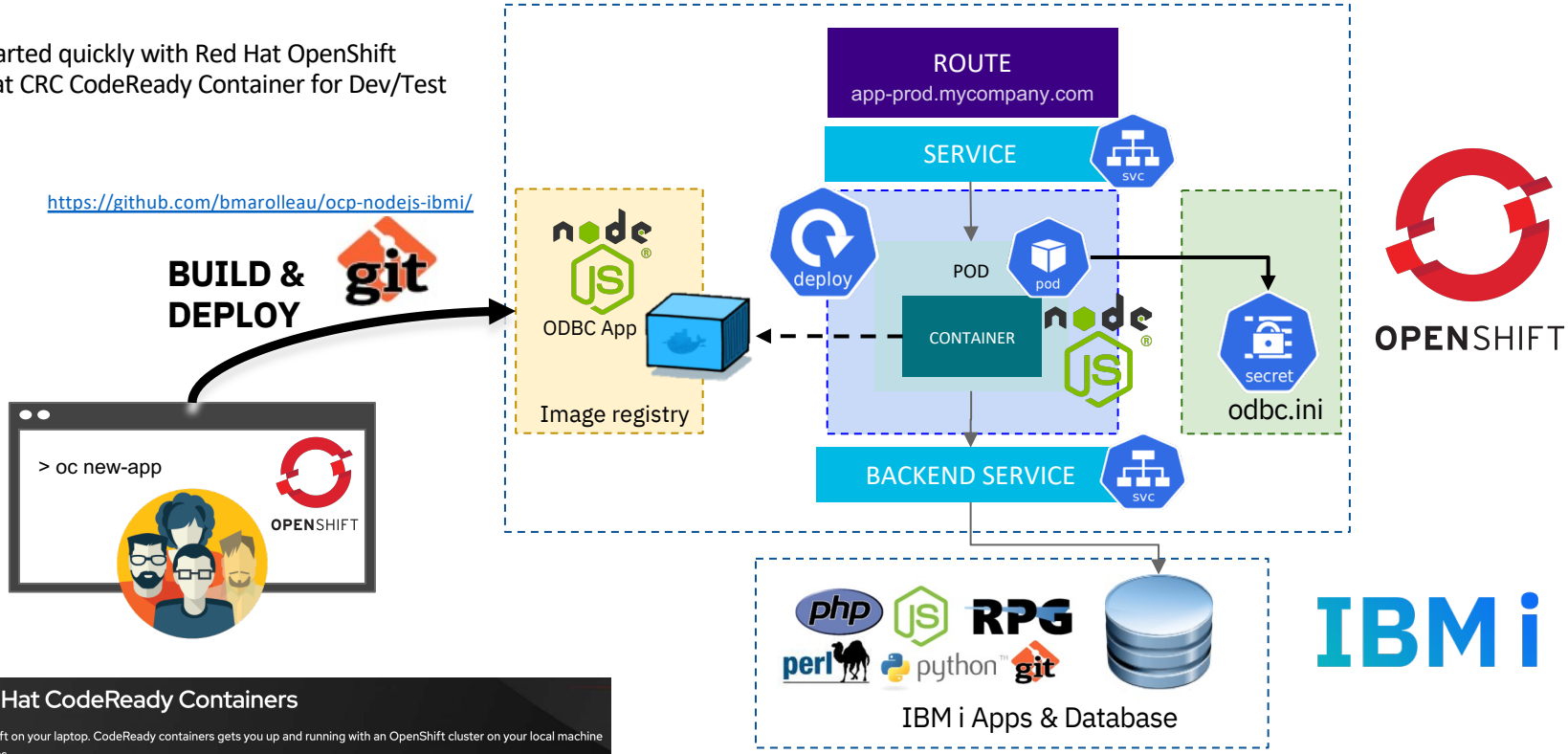
- ✓ **20 lines of code can make the difference…pushing customized information to your end-users…**
- ✓ **For ACME Air: booking & cancellation confirmations, destination weather (API) information, sales campaigns (broadcast or to particular users) , etc.**

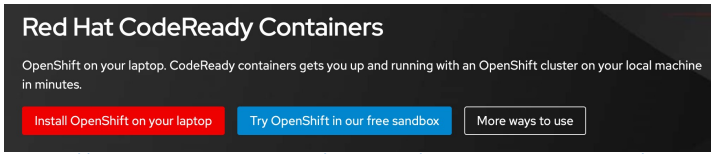
```
// Push Service Credentials from MobileFirst Console OR Bluemix Push Service
var APP_ID="<YOUR-APP-ID";
var APP_SECRET="<YOUR-APP-SECRET>";

if (process.argv.length <= 2) {
 console.log("Error 1:  Usage node pushMessage.js <userid> <message>");
 return;
}
userArg= process.argv[2];
messageArg=process.argv[3];

var Client = require('node-rest-client').Client;
var client = new Client();
// set content-type header and data as json in args parameter
var args = {
    path: { "APP_ID": APP_ID },
    data: { "message": { "alert": messageArg }, "target": { "userIds": [userArg] }, "settings": {"gcm": { "icon": "ic_stat_flight" } }  },
    headers: { "Content-Type": "application/json", "Accept": "application/json" , "appSecret": APP_SECRET, "Accept-Language": "en-US" }
};

client.post("https://mobile.ng.bluemix.net/imfpush/v1/apps/${APP_ID}/messages", args, function (data, response) {});
console.log("Sending Push Notification from IBM i to user "+userArg+" with message: "+messageArg);
```

Demo: Node.js App on OpenShift & IBM i

- Get Started quickly with Red Hat OpenShift
- Red Hat CRC CodeReady Container for Dev/Test

https://github.com/bmarolleau/ocp-nodejs-ibmi/





https://developers.redhat.com/products/codeready-containers/overview

soon available on IBM Developer

Ressources

IBM i RPMs (RedHat Technology) http://ibm.biz/ibmi-rpms

IBM i Open Source Support http://ibm.biz/ibmi-oss-support

Jesse Gorzinski's blog. http://ibm.biz/open-your-i
https://ibmsystemsmag.com/Power-Systems/06/2020/common-open-source-questions-answered

Exemples Open Source http://github.com/IBM/ibmi-oss-examples

IBM i customer stories http://ibm.biz/ibmistories

Community chat http://ibm.biz/ibmioss-chat (join at http://ibm.biz/ibmioss-chat-join)

Open Source , ILE , git

- https://github.com/OSSILE
- https://github.com/richardschoen/iforgit
- GIT source control on IBM i (presentation par Nathanael Bonnet, Common France)

Quel IDE choisir ? RDi mais également....

- https://gist.github.com/kskuhlman/d2cc089a95bae04431b1c231de488a18
- vscode - Code for IBM i