

Université **IBM i**

19 et 20 novembre 2024

IBM Innovation Studio Paris

S37 – Les APIs IBM RSE ou comment accéder à l'IBM i et à DB2 en REST

19 novembre 11:30 - 12:30

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uui2024

#ibmi

#uui2024



common
FRANCE

Université IBM i

19 et 20 novembre 2024

IBM i
continuous innovation
continuous integration



Centre de services IBM i

- Mutualisé
- A distance



Modernisation

- Accompagnement
- Prototypage



Expertise technique

- Prestations de service (audit, consulting...)
- Transfert de connaissances (workshops)



FORMATIONS

SUR SITE
A DISTANCE

INTER
SUR MESURE



COURS EN LIGNE

FORMATS COURS


REPLAYS EN LIGNE



BASE DE CONNAISSANCE

IBM i

EN LIGNE



GRMT5250

Consultez l'écran 5250 d'un autre utilisateur en temps réel directement sur l'IBM i

PRINCIPE
GRMT5250 vous permet d'accéder rapidement à l'écran 5250 d'un autre utilisateur, directement depuis votre session IBM i.
Il ne nécessite pas de passer par des outils intermédiaires tel que Teams.

ABONNEMENT ANNUEL 2000€ € HT / PARTITION

REPRENEZ LE CONTRÔLE

Inspiré de notre propre expérience dans la maintenance sur IBM i, nous l'avons conçu pour les professionnels de l'IBM i. Cette solution est idéale pour intervenir rapidement sur les sessions utilisateurs bloquées ou pour diagnostiquer et corriger des bugs en temps réel.

En plus de cette fonctionnalité clé, notre outil offre une gamme d'options supplémentaires qui simplifient la gestion des sessions utilisateurs sur l'IBM i, améliorant ainsi l'efficacité et la réactivité de votre équipe technique. Optez pour une solution intuitive et intégrée, qui vous permet de superviser au mieux les travaux de votre IBM i depuis votre poste de travail.


PRINCIPALES CARACTÉRISTIQUES

- Piloter simplement les travaux 5250
- Consulter les activités utilisateurs en temps réel
- Tous vos travaux interactifs et batch regroupés au même endroit via la console de GRMT5250
- Intervenir rapidement
- Gérer les messages en interrogation sur les sessions utilisateurs
- Gérer les sessions inactives

CONTACT

Demandez votre démo !

- ☎ 04 72 53 00 12
- ✉ contact@gaia.fr
- 🌐 <https://www.guia.fr>





1- APIs RSE ?

APIs RSE

- Des webservices REST fournis avec l'OS
 - Appels sécurisés par TLS
 - JSON
 - /QIBM/ProdData/OS/RSEAPI : le package API RSE
 - /QIBM/UserData/OS/RSEAPI : vide à l'installation. Si vous personnalisez les propriétés du serveur RSE, contient alors un fichier rseapi.properties
- Permet un accès depuis l'extérieur de votre IBMi pour :
 - Récupérer des informations
 - Lancer des commandes CL
 - Requête par SQL
 - Gérer le magasin de certificat DCM
- La bibliographie officielle : <https://www.ibm.com/support/pages/system/files/inline-files/IWS-rseapi.pdf>



2- Démarrage

Prérequis

- Les options logicielles suivantes doivent être installées pour IBM i 7.3, 7.4 et 7.5 :
 - 5770SS1 option 3 - Extended Base Directory Support
 - 5770SS1 option 12 - Host Servers
 - 5770SS1 option 30 - Qshell
 - 5770SS1 option 33 - PASE
 - 5770SS1 option 34 - Digital Certificate Manager
 - 5770DG1 - IBM HTTP Server for IBM i
 - 5770JV1 option 17 - IBM Java SE 8 64
- Bien sûr, mettre à jour les groupes de PTF pour HTTP et JAVA.

Mise en route

- Arrêt/Démarrage
 - STRTCPSVR SERVER(*HTTP) HTTPSVR(*ADMIN)
 - ENDTCPSPV SERVER(*HTTP) HTTPSVR(*ADMIN)
- Si l'administrateur a désactivé le démarrage automatique de l'ensemble des serveurs d'administration :
 - STRTCPSVR SERVER(*IAS) INSTANCE(admin5)
 - ENDTCPSPV SERVER(*IAS) INSTANCE(admin5)

```
Util
en
Opt  S-syst/trav  cours      Type  % UC  Fonction  Etat
---  ---          ---        ---   ---   ---        ---
---  QHTTPSVR     QSYS       SBS   0,0   PGM-QZHBMAIN  DEQW
---  ADMIN       QTMHHTTP   BCH   0,0   PGM-QZSRLOG   SIGW
---  ADMIN       QTMHHTTP   BCI   0,0   PGM-QZSRHTTP  SIGW
---  ADMIN       QTMHHTTP   BCI   0,0   PGM-QZSRHTTP  SIGW
---  ADMIN1      QWEBADMIN  BCI   0,0   JVM-/QIBM/Prod  THDW
---  ADMIN3      QWEBADMIN  BCI   0,0   JVM-/QIBM/Prod  THDW
---  ADMIN4      QWEBADMIN  BCI   0,0   JVM-/QIBM/Prod  THDW
---  ADMIN5      QLWISVR    BCI   0,0   JVM-/QIBM/Prod  THDW
```


Interface Graphique

- Se connecter depuis un navigateur : `http ://host:2001/HTTPAdmin` ou `https`

IBM Web Administration for i

Welcome QSECOFR

Setup Manage Advanced Related Links

All Servers HTTP Servers Application Servers Installations

Common Tasks and Wizards

Manage All Servers

All HTTP Servers All Application Servers

Data current as of 31 mai 2023 15:41:30.

Server	Version	Status	Address:Port	Description
<input type="radio"/> Admin1	V8.5 (int app svr)	Running	*:2002	
<input type="radio"/> Admin2	V8.5 (int app svr)	Stopped	*:2004,2005	navigator for i
<input type="radio"/> Admin3	V8.5 (int app svr)	Running	*:2006	
<input type="radio"/> Admin4	V8.5 (int app svr)	Running	*:2008	
<input checked="" type="radio"/> Admin5	V8.5 (int app svr)	Running	*:2011	
<input type="radio"/> Demo	V2.6 (web services)	Stopped	*:10015	Web services server pour faire des démos
<input type="radio"/> DEMOWS	V2.6 (web services)	Stopped	10.3.1.1:10104	Demo
<input type="radio"/> IBMARE	V8.5 (int app svr)	Stopped	Unknown	
<input type="radio"/> INTAPPSVR8	V8.5 (int app svr)	Stopped	10.3.1.1:10053	IBM integrated Web application server for i created by the Create Application Server wizard.
<input type="radio"/> IRIS	V2.6 (web services)	Stopped	*:10056	Web services server pour Projet IRIS
<input type="radio"/> LAN	V8.5 (int app svr)	Running	*:10002	IBM integrated Web application server for i created by the Create Application Server wizard.
<input type="radio"/> VOLUBIS	V8.5 (int app svr)	Running	*:10000	Volubis.fr
<input type="radio"/> WFORMATION	V2.6 (web services)	Stopped	*:10031	Web services server pour les formations
<input type="radio"/> WQLIB85	V8.5 (int app svr)	Stopped	*:12336	
<input type="radio"/> WSERVICE1	V2.6 (web services)	Stopped	*:10042	Web services server for somes Tests
<input type="radio"/> WSERVICE2	V2.6 (web services)	Stopped	*:10004	Web services server created by the Create Web Services Server wizard.

Refresh Start Stop Restart

Manage Details Delete Rename

S curisation

■ Configurer TLS

IBM Web Administration for i
Setup Manage Advanced | Related Links
All Servers | HTTP Servers | Application Servers | Installations
Running Server: Admin5 - V8.5 (int app svr)
Common Tasks and Wizards: Admin5 > Configure TLS
Wizards: **Configure TLS**
Server Properties: Properties, Logging
Tools: Create Certificate, Manage Certificates, Create Keystore
Problem Determination: View Logs, Web Log Monitor

Configure TLS

Welcome - Step 1 of 10

Welcome to the Configure TLS wizard. This wizard assists you in configuring TLS

- **Transport Layer Security (TLS)**
Transport Layer Security (TLS), and its now-deprecated predecessor, S
- **Digital certificate**
A digital certificate is an electronic credential used to establish proof of i signed. Each public key has an associated private key. The private key i private key associated with the public key contained within the digital ce
- **Keystore**
A keystore is a storage facility for cryptographic keys and certificates. Et protected format to prevent unauthorized access. Typically, a key stored contain a single public key certificate belonging to another party. It is cal (owner) of the certificate. The issuer of the certificate vouches for this, b

IBM Web Administration for i
Setup Manage Advanced | Related Links
All Servers | HTTP Servers | Application Servers | Installations
Running Server: Admin5 - V8.5 (int app svr)
Common Tasks and Wizards: Admin5 > Configure TLS
Application Server Wizards: **Configure TLS**, Disable TLS
Server Properties: Properties, Logging
Tools: Create Certificate, Manage Certificates, Create Keystore
Problem Determination: View Logs, Web Log Monitor

Configure TLS

Specify TLS port and protocol - Step 2 of 10

Specify the port number for secure communication and the TLS protocol for handshake. Most browsers make secure requests to port 443 by default.

TLS port: 2012
TLS protocol: TLSv1.3

Disable the non-TLS port?:
 Yes, disable non-TLS port while configuring TLS port
 No, leave non-TLS port enabled while still configuring TLS port

S curisation

IBM Web Administration for i
Setup **Manage** Advanced | Related Links
All Servers | HTTP Servers **Application Servers** Installations
Running Server: Admin5 - V8.5 (int app svr)

Admin5 > Configure TLS

Configure TLS

Specify keystore information - Step 3 of 10

Keystore is a storage facility for cryptographic keys and certificates. The truststore contains sigr be created.

Specify keystore information:

- Specify keystore path and type
- Use Digital Certificate Manager (DCM) SYSTEM store
- Specify different path for truststore

IBM Web Administration for i
Setup **Manage** Advanced | Related Links
All Servers | HTTP Servers **Application Servers** Installations
Running Server: Admin5 - V8.5 (int app svr)

Admin5 > Configure TLS

Configure TLS

Specify keystore password - Step 4 of 10

Keystore is stored in a protected format to prevent unauthorize for future access to it.

Specify the password for the keystore

Password:

S curisation

IBM Web Administration for i
Setup **Manage** Advanced | Related Links

All Servers | HTTP Servers **Application Servers** Installations

Running Server: Admin5 - V8.5 (int app svr)

Common Tasks and Wizards **Admin5 > Configure TLS**

Configure TLS

Specify Digital Certificate - Step 6 of 10

To configure TLS, your server must have a digital certificate. The server presents 1 server.

Specify digital certificate for server ?

Issue a new-self signed certificate

Select existing certificate from the keystore

Digital certificate: - Select -

Note: Digital certifi

- CIBRETAGNE223 *
- SANDEN - LOCAL *
- ADMIN HTTP
- CIBRETAGNE423
- CIBRETAGNE1222 *
- NEPTUNE
- CLUBIPL223 *
- COMMONFRANCE123 *
- POWER8 *

IBM Web Administration for i Welcome QSECOFR

Setup **Manage** Advanced | Related Links

All Servers | HTTP Servers **Application Servers** Installations

Running Server: Admin5 - V8.5 (int app svr)

Common Tasks and Wizards **Admin5 > Configure TLS**

Configure TLS

Specify cipher for TLS - Step 8 of 10

Specify cipher for TLS ?

Default ciphers

Select ciphers from available ciphers list

Available ciphers

- TLS_AES_256_GCM_SHA384
- TLS_AES_128_GCM_SHA256
- TLS_CHACHA20_POLY1305_SHA256

Enabled ciphers for TLS

S curisation

IBM Web Administration for i
Setup **Manage** Advanced | Related Links
All Servers | HTTP Servers **Application Servers** Installations
Running [Stop] [Refresh] Server: Admin5 - V8.5 (int app svr)

Common Tasks and Wizards [Admin5 > Configure TLS](#)

Application Server Wizards
Configure TLS
Disable TLS

Server Properties
Properties
Logging

Tools
Create Certificate
Manage Certificates
Create Keystore

Problem Determination
View Logs
Web Log Monitor

Configure TLS

Restart the server now? - Step 9 of 10

To make the configuration takes effect after finishing this wizard, t

Restart the server later by yourself
 Restart the server immediately after the wizard

IBM Web Administration for i Welcome QSECOFR
Setup **Manage** Advanced | Related Links
All Servers | HTTP Servers **Application Servers** Installations
Running [Stop] [Refresh] Server: Admin5 - V8.5 (int app svr)

Common Tasks and Wizards [Admin5 > Configure TLS](#)

Application Server Wizards
Configure TLS
Disable TLS

Server Properties
Properties
Logging

Tools
Create Certificate
Manage Certificates
Create Keystore

Problem Determination
View Logs
Web Log Monitor

Configure TLS

Summary - Step 10 of 10

When you click **Finish**, this wizard configures TLS for this server.

IP address:	All IP addresses
TLS port:	2012
SSL protocol:	TLSv1.3
Keystore:	DCM SYSTEM store
Certificate Name:	QIBM_APP_SERVER_ADMIN5

Note: When the configuration is completed, the wizard restarts the server to make the configuration take effect. After the restart, applications can be securely accessed using TLS.



3- Interface graphique OPENAPI

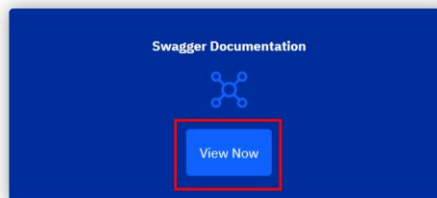
Lancement

- Depuis un navigateur :
 - Non sécurisé : `http://host:2011/rseapi` Uniquement de la consultation d'openapi, aucune requête ne répondra
 - Sécurisé : `https://host:2012/rseapi`



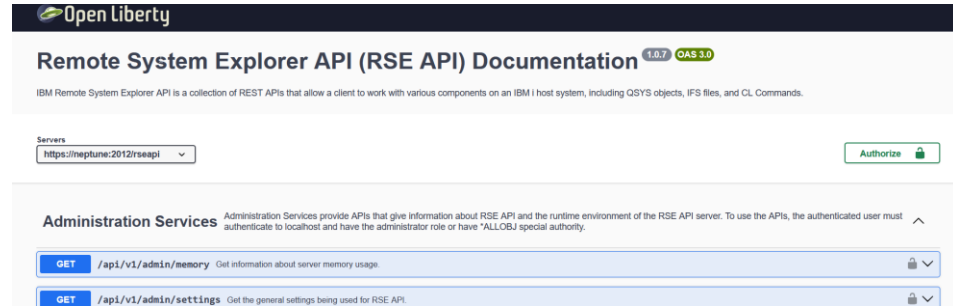
Remote System Explorer API (RSE API)

IBM Remote System Explorer API is a collection of REST APIs that allow a client to work with various components on an IBM i host system, including QSYS objects, IFS files, jobs, and CL Commands.



Lancement

- Accès direct à open liberty
 - <https://host:2012/openapi/ui>



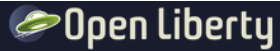
- Accès à la documentation au format openapi 3.0.0 : <https://host:2012/openapi>
 - Permet l'import des API dans des logiciels

```
openapi: 3.0.0
info:
  title: Remote System Explorer API (RSE API) Documentation
  description: "IBM Remote System Explorer API is a collection of REST APIs that allow
  \ a client to work with various components on an IBM i host system, including\
  \ QSYS objects, IFS files, and CL Commands."
  version: 1.0.7
servers:
- url: https://neptune:2012/rseapi
tags:
- name: Administration Services
  description: "Administration Services provide APIs that give information about RSE\
  \ API and the runtime environment of the RSE API server. To use the APIs, the\
  \ authenticated user must authenticate to localhost and have the administrator\
  \ role or have *ALLOBJ special authority."
- name: CL Command Services
```

Authentification

- Authentification Basique
 - A chaque appel d'API il faut envoyer un entête contenant le profil et le mot de passe encodé en base64
 - Authorization: Basic BASE64(userid:password)
- Authentification par un jeton - création d'une session
 - Appel d'une première API à laquelle on transmet profil et mot de passe. L'API renvoie un jeton de session (token sous la forme d'un GUID) à transmettre en entête de toutes les requêtes suivantes.
 - Authorization: Bearer 4eaa14e6-ea9c-4dde-b6f7-f542b34d5309-60da75d3-3132
 - Permet d'indiquer des attributs de session.
 - Pensez à appeler l'API de logout qui invalide le jeton.

Login



Remote System Explorer API (RSE API) Documentation 1.0.8 OAS 3.0

IBM Remote System Explorer API is a collection of REST APIs that allow a client to work with various components on an IBM i host system, including QSYS objects, IFS files, and CL Commands.

Servers

https://neptune:2012/rseapi

Available authorizations

x

bearerHttpAuthentication (http, Bearer)

Bearer token authentication.

Value:

Authorize Close

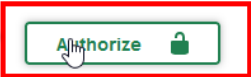
basicHttpAuthentication (http, Basic)

Basic authentication.

Username:

Password:

Authorize Close



Obtention token

POST /api/v1/session Authenticate with user credentials and return an embedded token.

Authenticate with user credentials and return an embedded token to access different RSE APIs. On succesful authentication, a token is returned in the Authorization HTTP header. The client must send this token in the Authorization HTTP header when making requests to protected RSE APIs. For example:

Authorization: Bearer 4eaa14e6-ea9c-4dde-b6f7-f542b34d5309-60da75d3-3132

For optimal performance, specify localhost to access objects located on the same system in which the RSE APIs are hosted on. If accessing objects on a remote system using the RSE APIs, the host servers on the remote system must be enabled for secure communications.

Alternatively, the non-session APIs may be invoked using basic authentication. In this case, the credentials must always be sent on every request.

Parameters

No parameters

Request body required

The user credentials to be authenticated.

Example Value | Schema

```
{
  "host": "localhost",
  "userid": "user",
  "password": "pwd"
}
```

Try it out

application/json

Response headers

```
authorization: Bearer ac720359-bfb7-47e9-969d-f8f1889f4aa3-6734bcc5-3137322e33302e372e323038
content-language: fr-FR
content-length: 0
date: Wed, 13 Nov 2024 14:50:45 GMT
strict-transport-security: max-age=31536000; includeSubDomains
```



4- Commande CL /api/v1/cl

Définition d'une commande

CL Command Services CL Command Services provide APIs for running CL commands.

PUT /api/v1/c1 Run one or more CL commands on the server.

GET /api/v1/c1/{commandname} Retrieves the command definition for the specified CL command.

Retrieves the command definition for the specified CL command. The command definition is returned as an XML document. The generated command information XML source is called Command Definition Markup Language or CDML. See the Document Type Definition (DTD) in /QIBM/XML/DTD/QcdCLCmd.dtd for the definition of the CDML tag language returned by this API.

Parameters

Try it out

Name	Description
------	-------------

Authorization string	<input type="text" value="Authorization"/>
-------------------------	--

library string (query)	The library name. Valid values are a specific name, or one of the following special values:
------------------------------	---

- *CURLIB - The current library is searched.
- *LIBL - The library list is searched. This is the default.

ignorecase boolean (query)	Boolean indicating whether case should be ignored. The default value is 'true'. If set to 'false', the library and command name will not be uppercased.
----------------------------------	---

commandname * required string (path)	The CL command name.
--	----------------------

Execute

Clear

Définition d'une commande - Réponse

200

Response body

```
{
  "definition": "<QcdCLCmd DTDVersion=\\"1.0\\"><Cmd CmdName=\\"DSPLIB\\" CmdLib=\\"__LIBL\\" CCSID=\\"37\\" HlpPnlGrp=\\"QHLCMD\\" HlpPnlGrpLib=\\"__LIBL\\" HlpID=\\"DSPLIB\\" MaxPos=\\"1\\" Prom
pt=\\"Afficher liste bibliothèques\\" MsgF=\\"QCPFMSG\\" MsgFLib=\\"__LIBL\\" ExecBatch=\\"YES\\" ChgCmdExit=\\"NO\\" RtvCmdExit=\\"NO\\"><Parm Kwd=\\"OUTPUT\\" PosNbr=\\"1\\" KeyParm=\\"NO\\" Type=\\"C
HAR\\" Min=\\"0\\" Max=\\"1\\" Prompt=\\"Sortie\\" Len=\\"1\\" Rstd=\\"YES\\" Dft=\\"*\\" AlwUnprt=\\"YES\\" AlwVar=\\"YES\\" Expr=\\"YES\\" Full=\\"NO\\" DspInput=\\"YES\\" Choice=\\"*, *PRINT\\" </SpcVal></V
alue Val=\\"*\\" MapTo=\\"*\\"><Value Val=\\"*PRINT\\" MapTo=\\"L\\"></SpcVal></Parm></Cmd></QcdCLCmd>"
}
```

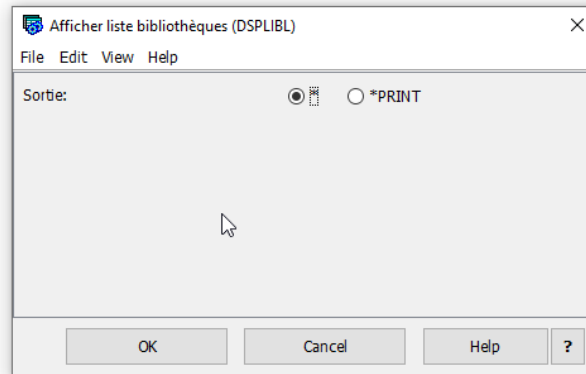
Download

Response headers

```
content-language: fr-FR
content-length: 647
content-type: application/json;charset=utf-8
date: Wed, 13 Nov 2024 14:57:32 GMT
strict-transport-security: max-age=31536000; includeSubDomains
```

- Vous pouvez à partir de la réponse, générer un prompt type run sql d'acs, RDI, VS code...

```
cl: dsplibl
```



Exécution de commandes

CL Command Services CL Command Services provide APIs for running CL commands.

PUT /api/v1/c1 Run one or more CL commands on the server.

Run one or more CL commands on the server. If a command fails, any messages relating to the error is returned. If the command succeeds, no data is returned. By default, a response payload will be returned if an error occurs that will include the first level message text. If you want the full message details, set the includeMessageHelpText property to true. If you want messages returned in all cases, set the includeMessageOnSuccess property to true.

Parameters

Cancel

Reset

Name	Description
------	-------------

Authorization	The authorization HTTP header.
---------------	--------------------------------

string
(header)

Request body

application/json

List of CL commands to run. If more than one CL command is to be run, you can indicate whether all commands should be run even if an error is encountered while running a CL command.

```
{
  "continuousOnError": true,
  "includeMessagesOnSuccess": true,
  "includeMessageHelpText": false,
  "clCommands": [
    "qsvs/ctrlib DTIBM24",
    "qsvs/ctrlscrf DTIBM24/qrcglessc"
  ]
}
```

Exécution de commandes - Réponse

- Total des commandes lancées
 - Total des commandes OK
 - Total des commandes KO
- Un tableau avec un enregistrement par commande lancée
 - OK / KO
 - Commande
 - Message

```
200
Response body
{
  "totalIssued": 2,
  "totalSuccesses": 2,
  "totalFailures": 0,
  "commandOutputList": [
    {
      "success": true,
      "command": "qsys/crtlib DTIBM24",
      "output": [
        "CPC2102: Bibliothèque DTIBM24 créée. "
      ]
    },
    {
      "success": true,
      "command": "qsys/crtsrcpf DTIBM24/QRPGLESRC",
      "output": [
        "CPC7301: Fichier QRPGLESRC créé dans la bibliothèque DTIBM24. "
      ]
    }
  ]
}
```

Exécution de commandes - Limite

- Limité au droit de l'utilisateur

```
{  
  "continueOnError": true,  
  "includeMessageOnSuccess": true,  
  "includeMessageOnError": false,  
  "clCommands": [  
    "savsecdta dev(*savf) savf(dtibm24/secdta)"  
  ]  
}
```

200

Response body

```
{  
  "totalIssued": 1,  
  "totalSuccesses": 0,  
  "totalFailures": 1,  
  "commandOutputList": [  
    {  
      "success": false,  
      "command": "savsecdta dev(*savf) savf(dtibm24/secdta)",  
      "output": [  
        "CPF222E: Le droit spécial *SAVSYS est requis. "  
      ]  
    }  
  ]  
}
```



5- SQL

/api/v1/sql

SQL

- Fonctionnement identique

PUT /api/v1/sql Run a SQL statement on the server.

Run a SQL statement on the server. If SQL statement fails, any messages related to the SQL state information is returned only if errors are detected. You have the option to return the result set to return, no data is returned in the response.

Parameters

Name	Description
Authorization	The authorization HTTP header.

string (header)

Request body *required*

The SQL statement to be run on the server.

```
{
  "alwaysReturnSQLStateInformation": false,
  "treatWarningsAsErrors": false,
  "sqlStatement": "select * from dtibm24.taldup "
}
```

Code **Details**

200

Response body

```
{
  "resultSet": [
    {
      "ZALAC1": "Hello",
      "ZALAC2": "Bonjour",
      "ZALAC3": "Hi"
    },
    {
      "ZALAC1": "Session IBM24",
      "ZALAC2": "n° 37",
      "ZALAC3": "API RSE"
    }
  ]
}
```

Response headers

```
content-language: fr-FR
content-length: 156
content-type: application/json;charset=utf-8
date: Fri, 15 Nov 2024 10:01:23 GMT
strict-transport-security: max-age=31536000; includeSubDomains
```

Responses

SQL – Warning

- Toutes les opérations sont possible
 - Create
 - Insert
 - Delete
 - Drop
 - ...
- On peut exécuter des procédures
 - Comme avec de l'ODBC, du JDBC, et autres connecteurs...



6- Gestion sessions /api/v1/session

Session

Session Services

Session Services provide APIs for authenticating a user and managing sessions that are tied to an authenticated user. The user must have a user profile on the IBM i server to be accessed. Once authenticated, a bearer token is returned and must be submitted on requests when invoking protected APIs in an HTTP authorization header.

GET /api/v1/session Get information about the session.

PUT /api/v1/session Refresh session settings.

- Get : récupère les informations de la session
 - Jeton
 - Liste bibliothèque
 - Environnement SQL
 - Variables d'environnement
 - Travail
- Put permet de les modifier pour gérer l'environnement de travail



7- gestion du magasin de certificats DCM `/api/v1/security`

Security Services

All the digital certificate management APIs require the Digital Certificate Manager, option 34 of the IBM i licensed program (5 must have the *ALLOBJ and *SECADM special authorities).

POST /api/v1/security/dcm/cert/delete Delete a digital certificate.

GET /api/v1/security/tls Retrieve system transport layer security (TLS) attributes.

POST /api/v1/security/dcm/cert/export Export a digital certificate.

POST /api/v1/security/dcm/cert/info Get detailed certificate information.

POST /api/v1/security/dcm/appdef/associate Associate digital certificates to an application definition.

GET /api/v1/security/dcm/appdef/list List application definitions.

POST /api/v1/security/dcm/appdef/untrust Remove a certificate authority (CA) digital certificate from the application definition CA trust list.

POST /api/v1/security/dcm/appdef/disassociate Disassociate digital certificates from an application definition.

POST /api/v1/security/dcm/cert/list Retrieve a list of certificates in a certificate store.

POST /api/v1/security/dcm/certstore/changepassword Change digital certificate store password.

POST /api/v1/security/dcm/appdef/trust Add certificate authority (CA) digital certificate to the application definition CA trust list.

POST /api/v1/security/dcm/cert/import Import a digital certificate.

GET /api/v1/security/tls/stats Retrieve system transport layer security (TLS) statistics.

DCM et TLS

- 13 services à disposition
- TLS : 2 services - /tls
 - Liste des protocoles et cipher supportés
 - Statistique d'utilisation, il faut une option dans SST d'activée
- DCM : 11 services – on peut tout faire...ou presque !
 - /dcm/cert : gestion des certificats : 5 services
 - /dcm/appdef : gestion des application et association : 5 services
 - /dmc/certstore : gestion du magasin : 1 service

Certificat - /dcm/cert

- Import / Export certificat
- Suppression
- Information sur un certificat
- Lister les certificats avec filtre sur
 - Le type de certificat
 - Un nom d'alias, générique possible avec *
 - Un nombre de jours avant expiration
 - Exclure ou non les périmés

Liste des certificats périmés

```
{
  "certStoreType": "CMS",
  "certStorePath": "*SYSTEM",
  "certStorePassword": "IBM24",
  "filters": {
    "certAlias": "*",
    "certTypes": [
      "SERVER_CLIENT",
      "CA",
      "CSR"
    ],
    "daysUntilExpiration": 0,
    "excludeExpired": false
  }
}
```

200

Response body

```
{
  "certificates": [
    {
      "alias": ".*",
      "commonName": ".*",
      "type": "CA",
      "daysBeforeExpiration": -2193,
      "keyAlgorithm": "RSA",
      "keySize": 2048,
      "hasPrivateKey": false,
      "signatureAlgorithm": "RSA_SHA256"
    },
    {
      "alias": "aig",
      "commonName": ".*",
      "type": "SERVER_CLIENT",
      "daysBeforeExpiration": -176,
      "keyAlgorithm": "RSA",
      "keySize": 2048,
      "hasPrivateKey": true,
      "signatureAlgorithm": "RSA_SHA256"
    },
    {
      "alias": "as400",
      "commonName": "Volubis",
      "type": "SERVER_CLIENT",
      "daysBeforeExpiration": -316,
      "keyAlgorithm": "RSA",

```

Liste des certificats arrivants à péremption dans 130 jours

```
{  
  "certStoreType": "CMS",  
  "certStorePath": "*SYSTEM",  
  "certStorePassword": "IBM24",  
  "filters": {  
    "certAlias": "*",  
    "certTypes": [  
      "SERVER_CLIENT",  
      "CA",  
      "CSR"  
    ],  
    "daysUntilExpiration": 130,  
    "excludeExpired": true  
  }  
}
```

Response body

```
{  
  "certificates": [  
    {  
      "alias": "QIBM_HTTP_SERVER_DT3",  
      "commonName": "neptune.gaiia.lan",  
      "type": "SERVER_CLIENT",  
      "daysBeforeExpiration": 121,  
      "keyAlgorithm": "RSA",  
      "keySize": 2048,  
      "hasPrivateKey": true,  
      "signatureAlgorithm": "RSA_SHA256"  
    },  
    {  
      "alias": "QIBM_HTTP_SERVER_DT3_2",  
      "commonName": "neptune.gaiia.lan",  
      "type": "SERVER_CLIENT",  
      "daysBeforeExpiration": 127,  
      "keyAlgorithm": "RSA",  
      "keySize": 2048,  
      "hasPrivateKey": true,  
      "signatureAlgorithm": "RSA_SHA256"  
    },  
    {  
      "alias": "QIBM_HTTP_SERVER_DT3_test",  
      "commonName": "neptune.gaiia.lan",  
      "type": "SERVER_CLIENT",  
      "daysBeforeExpiration": 130,  
      "keyAlgorithm": "RSA",  
      "keySize": 2048,  
      "hasPrivateKey": true,  
      "signatureAlgorithm": "RSA_SHA256"  
    }  
  ]  
}
```

Application - /dcm/appdef

- Liste les applications
 - Nom application
 - Type
 - Les certificats associés
- Associer / désassocier des certificats
- Ajouter / Retirer une autorité de certification d'une application

Limitation

- Vous ne pouvez pas générer un certificat auto-signé par les API RSE
- Si vous détectez un certificat auto-signé arrivant à expiration, vous devrez passer par DCM pour le renouveler.



8- IFS et QSYS

■ IFS – Recherche, lecture et écriture

IFS Services Integrated File System (IFS) Services provide APIs for accessing objects in a way that is like pe from files, and writing to files.

GET `/api/v1/ifs/{path}` Get the content of a file.

PUT `/api/v1/ifs/{path}` Write textual data to a file.

GET `/api/v1/ifs/list` Gets a list of objects in the specified path.

GET `/api/v1/ifs/{path}/info` Returns information about the object referenced by the path.

■ QSYS – fonction de recherche

QSYS Services QSYS Services provide APIs for accessing QSYS objects.

GET `/api/v1/qsys/search/{objectName}` Returns a list of QSYS.LIB objects that match the search criteria.



9- Services d'administration

Sécurité

- Comme tout accès à votre machine, vous devez gérer la sécurité
- La première des sécurités, les droits sur les profils ! Ils seront appliqués
- Les profils en possibilités restreintes peuvent utiliser les API et donc lancer des commandes CL
- Vous pouvez :
 - Contrôler les accès
 - Limiter les accès
- Ne laisser pas la porte grande ouverte !

Contrôle - Admin/sessions

- 2 API, un GET et un DELETE
- GET : Liste les **sessions** en cours, ne prend pas en compte les authentifications basiques

GET /api/v1/admin/sessions Get information about sessions.

Get information about sessions. The information that is returned applies to active sessions on the server. /

Parameters

Name	Description
Authorization string (header)	The authorization HTTP header. <input type="text" value="Authorization"/>

Execute

200

Response body

```
{
  "totalSessions": 1,
  "sessions": [
    {
      "userid": "DT",
      "sessionCount": 0
    },
    {
      "userid": "UNIV",
      "sessionCount": 1
    }
  ]
}
```

Response headers

Contrôle - Admin/sessions

- DELETE : Ferme toutes les sessions d'un utilisateur, ou de tout le monde (*ALL)
- Comme pour le GET, les appels par authentification basique ne sont pas concernés, ce ne sont pas des sessions
- Vous pouvez vous auto bannir ! Permet de fermer toutes ses sessions en un appel, au lieu d'appeler l'API de révocation d'un token pour chaque session active

user The session(s) to delete. Specify the user ID to delete all sessions created by the use

string
(query)

Execute

204

Response headers

```
content-language: fr-FR
content-length: 0
date: Sat, 16 Nov 2024 13:33:22 GMT
strict-transport-security: max-age=31536000; includeSubDomains
```

Limitation- Admin/settings

- 2 APIs
 - GET : récupération de la configuration actuelle
 - POST : tuning de la conf

The settings for RSE API.

```
{
  "persist": false,
  "adminUsers": [],
  "includeUsers": [],
  "excludeUsers": [],
  "maxFileSize": 3072000,
  "maxSessionInactivity": 7200,
  "maxSessionLifetime": 21600,
  "maxSessionUseCount": 1000,
  "maxSessionWaitTime": 300,
  "maxSessions": 100,
  "maxSessionsPerUser": 20,
  "sessionCleanupInterval": 300
}
```

Limitation- Admin/settings

- Persist : true/false – Persistance de la conf au redémarrage du service, génère un fichier rseapi.properties dans /QIBM/UserData/OS/RSEAPI
- adminUsers : Utilisateurs avec rôle d'admin dans RSEAPI
- includeUsers : Tous les autres exclus
- excludeUsers : Tous les autres inclus
- maxFileSize : Taille maximum des fichiers IFS manipulés
- maxSessionInactivity : Nb seconde d'inactivité avant invalidation
- maxSessionLifetime : Nb seconde totale avant invalidation
- maxSessionUseCount : Nb maximum d'usage de la session
- maxSessionWaitTime : Nb seconde d'attente pour obtenir la disponibilité de la session
- maxSessions : Nb de sessions maximum
- maxSessionsPerUser : Nb de sessions maximum par utilisateur
- sessionCleanupInterval : intervalle d'exécution du daemon de maintenance



10- Export / Import des API

Récupération de la définition des API

- <https://host:2012/openapi>

```
openapi: 3.0.0
info:
  title: Remote System Explorer API (RSE API) Documentation
  description: "IBM Remote System Explorer API is a collection of REST APIs that allow\
    \ a client to work with various components on an IBM i host system, including\
    \ QSYS objects, IFS files, and CL Commands."
  version: 1.0.8
servers:
- url: https://neptune:2012/rseapi
tags:
- name: Administration Services
  description: "Administration Services provide APIs that give information about RSE\
    \ API and the runtime environment of the RSE API server. To use the APIs, the\
    \ authenticated user must authenticate to localhost and have the administrator\
    \ role or have *ALLOBJ special authority."
- name: CL Command Services
  description: 'CL Command Services provide APIs for running CL commands. '
- name: IFS Services
  description: "Integrated File System (IFS) Services provide APIs for accessing objects\
    \ in a way that is like personal computer and UNIX operating systems. This includes\
    \ listing objects in directories, reading from files, and writing to files."
- name: QSYS Services
  description: 'QSYS Services provide APIs for accessing QSYS objects. '
- name: SQL Services
  description: 'SQL Services provide APIs associated with performing SQL operations. '
- name: Security Services
  description: "Security Services provide APIs relating to security, such as the management\
    \ of digital certificates and the retrieval of TLS system information. \n\nAll\
    \ the digital certificate management APIs require the Digital Certificate Manager,\
```


Import dans un outils compatible

■ Copier / coller le texte brut

Choose how to import your API

Postman Collection

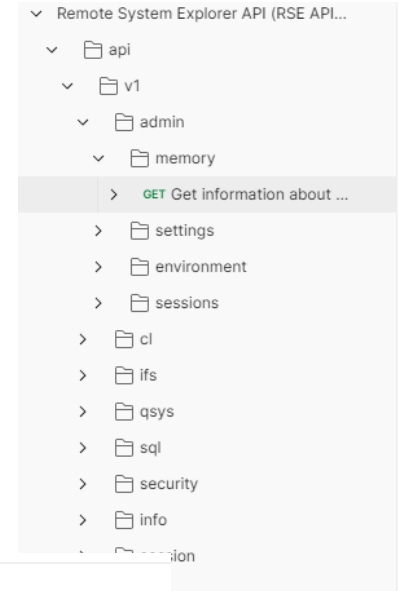
Remote System Explorer API (RSE API) Documentation

OpenAPI 3.0 with a Postman Collection

📘 You can create up to 3 APIs. [Learn more about plans](#) ↗

[View Import Settings](#)

[Back](#) [Import](#)



```
1 {  
2   "password": "IBM24",  
3   "userid": "univ",  
4   "host": "localhost"  
5 }
```

body Cookies Headers (5) Test Results | 201 Created • 125 ms • 261 B

Key	Value
Authorization	Bearer 51030e9a-c892-487f-be0a-a20608cf185d-673b0dc3-3137322e33302e31312e34
Date	Mon, 18 Nov 2024 09:49:55 GMT



11- Questions

MEREC