

A little bit of Rest Magic

IBM BIGFIX

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magic (*usually uncountable, plural magics*)

The use of rituals or actions, especially based on supernatural or occult knowledge, to manipulate or obtain information about the natural world, especially when seen as falling outside the realm of religion; also the forces allegedly drawn on for such practices. [from 14th c.] [quotations ▼]

A specific ritual or procedure associated with supernatural magic or with mysticism; a spell. [from 14th c.]

Something producing remarkable results, especially when not fully understood; an enchancing quality; exceptional skill. [from 17th c.] [quotations ▼]

A conjuring trick or illusion performed to give the appearance of supernatural phenomena or powers. [from 19th c.]

A specific kind of special power or ability.

magic (*usually uncountable, plural magics*)

Something producing remarkable results, especially when not fully understood; an enchanting quality; exceptional skill. [from 17th c.]

Agenda

- Survey of what is possible
 - Client Side API
 - Server Side API
- Troubleshooting Rest API
- Examples
 - Query Tester Tool
 - CVE Dashboard
 - Automatic Patch Tool



HOW DOES ONE PERFORM REST API MAGIC?

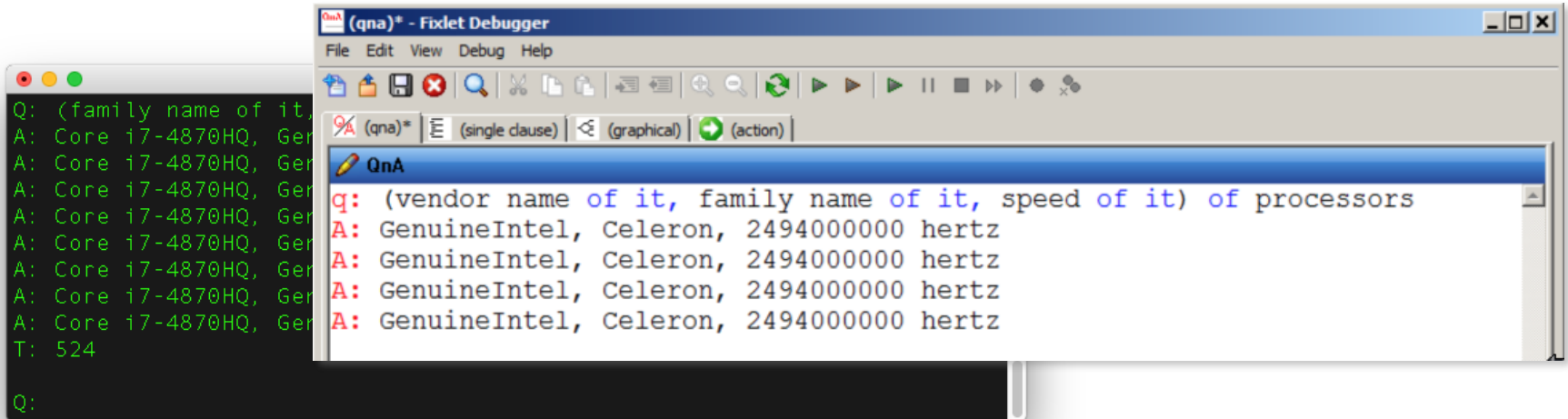
What Is possible with BigFix Magic?

An augmented using BigFix REST API producing remarkable results, especially when not fully understood by the end user

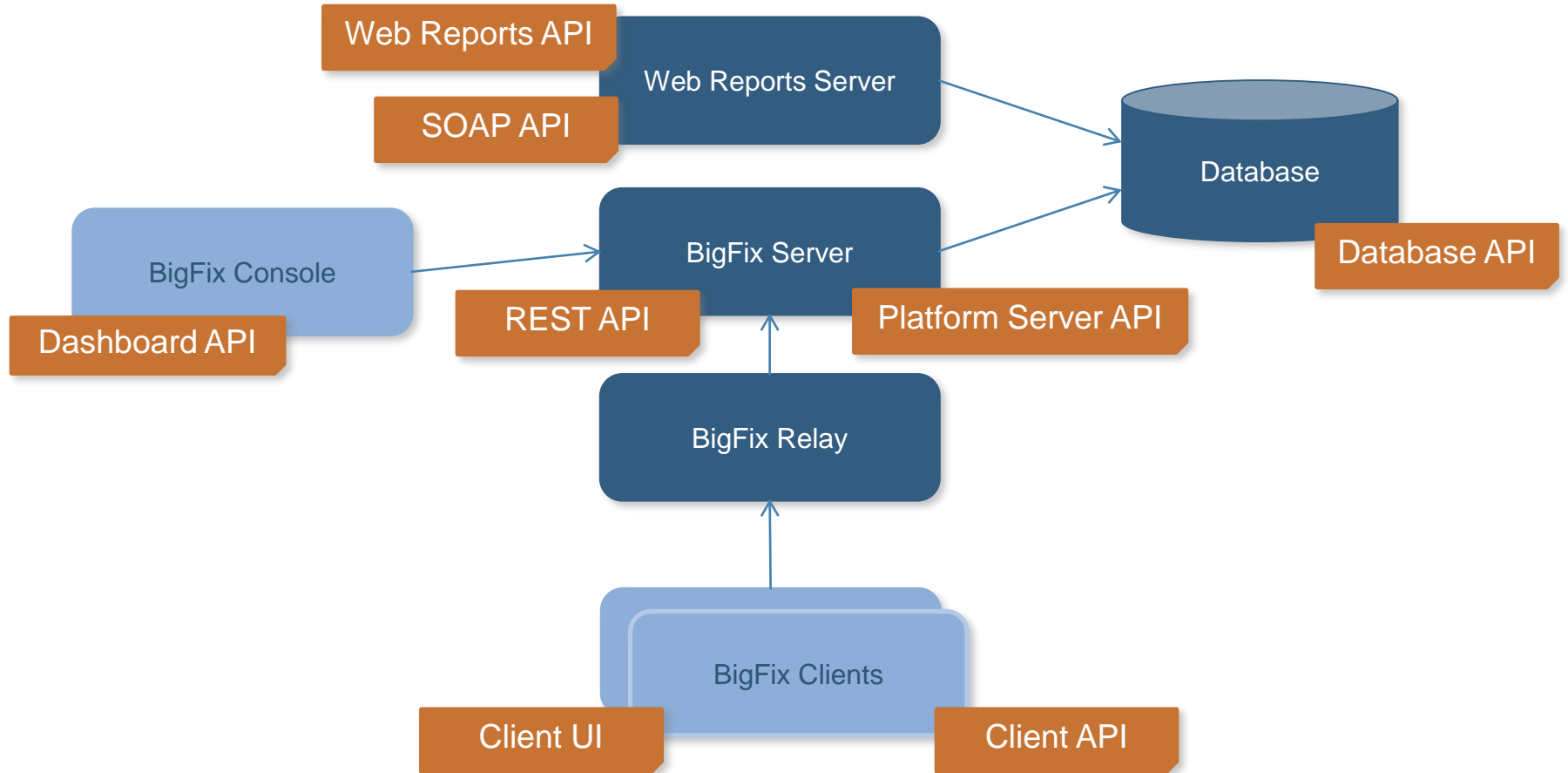


BigFix Relevance & ActionScript Language

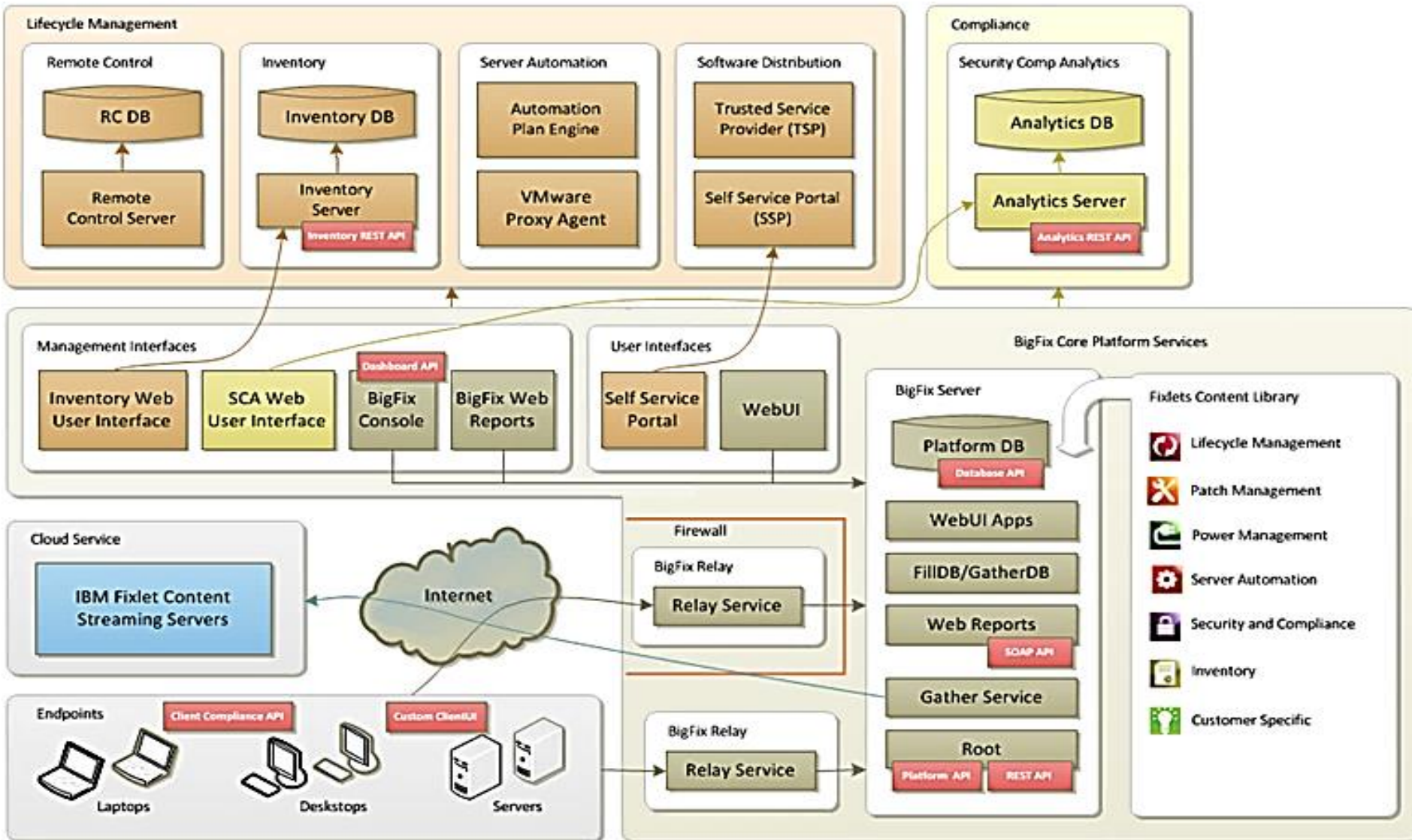
- Foundational scripting language used for all
 - Fixlets, Tasks, Analyses, Baselines, Properties
 - Same language construct across all components
- High level non-procedural 4GL
- Cross platform for Windows, UNIX, Linux, and Mac OS X



BigFix APIs



BigFix Architecture Components





Client Side API's



BigFix Client APIs

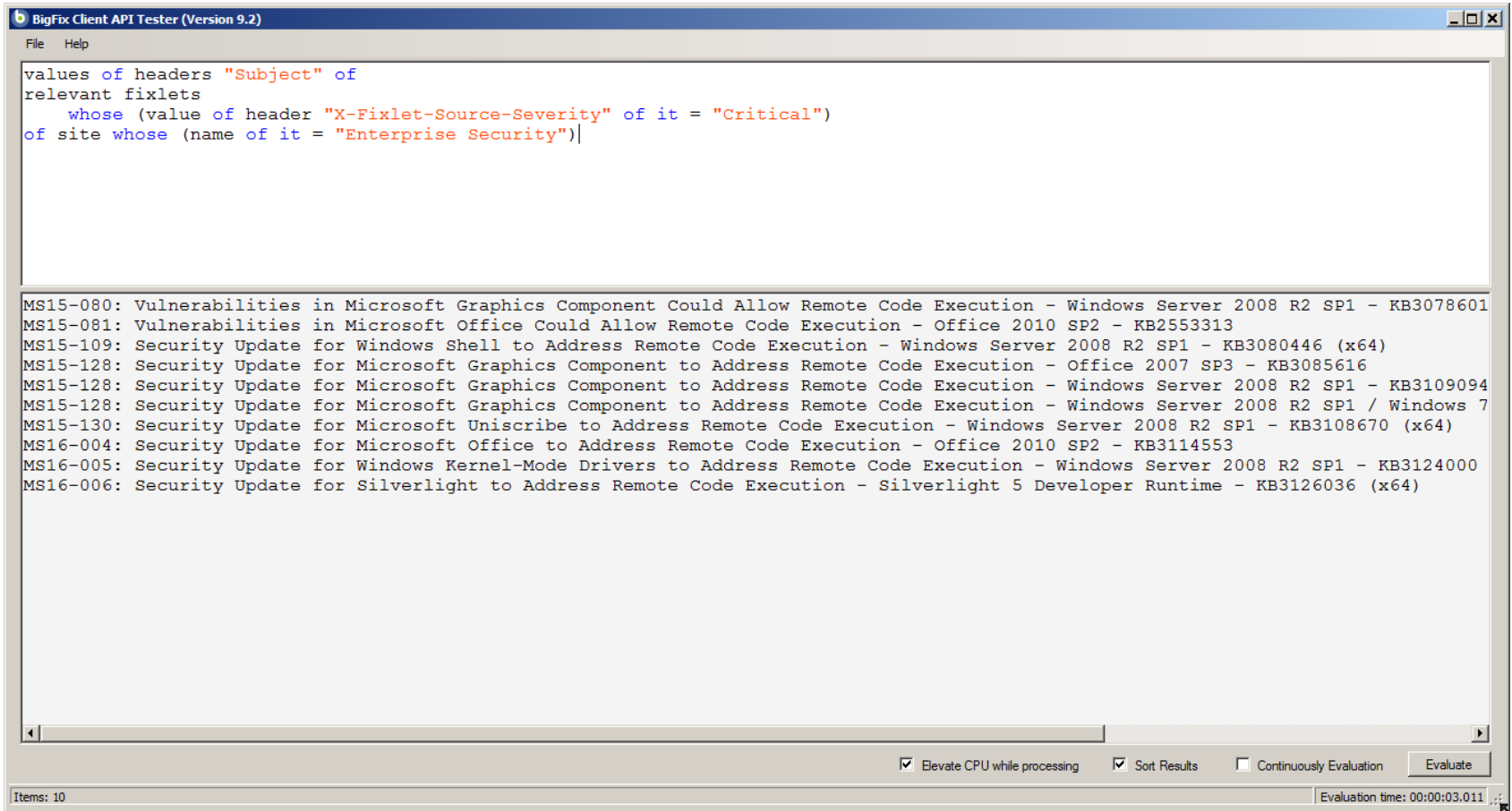
API	Execute Against	Language / Interface	Read or Write	Popularity (10 – high, 1 – low)	Demo / Uploaded
Client API	BigFix Client	Client Relevance / MS COM	Read	2	Yes / Yes
Client UI	BigFix Client	HTML, Client Relevance / -	Read	2	Yes / No

Client API

- Microsoft COM based API
- Used to query BigFix Client for endpoint information
- Commonly used to interface with other endpoint agents (e.g. NAC), or custom end-user applications
- Allows BigFix partners and integrators to expose the results of an endpoint inspection conducted by the BigFix Client to their own logic **embedded** in 3rd-party clients executing on the client machine
- Potential use cases
 - Detect if security products (anti-virus, firewall) are installed or running
 - Detect that wireless networks are disabled
 - Patch status on the endpoint

Added Content – Not Presented.

Client API – Example Client API Tester



The screenshot shows the BigFix Client API Tester (Version 9.2) window. The title bar includes the application name and standard window controls. The menu bar has 'File' and 'Help'. The main text area contains a query:

```
values of headers "Subject" of
relevant fixlets
  whose (value of header "X-Fixlet-Source-Severity" of it = "Critical")
of site whose (name of it = "Enterprise Security")|
```

Below the query, a list of search results is displayed:

- MS15-080: Vulnerabilities in Microsoft Graphics Component Could Allow Remote Code Execution - Windows Server 2008 R2 SP1 - KB3078601
- MS15-081: Vulnerabilities in Microsoft Office Could Allow Remote Code Execution - Office 2010 SP2 - KB2553313
- MS15-109: Security Update for Windows Shell to Address Remote Code Execution - Windows Server 2008 R2 SP1 - KB3080446 (x64)
- MS15-128: Security Update for Microsoft Graphics Component to Address Remote Code Execution - Office 2007 SP3 - KB3085616
- MS15-128: Security Update for Microsoft Graphics Component to Address Remote Code Execution - Windows Server 2008 R2 SP1 - KB3109094
- MS15-128: Security Update for Microsoft Graphics Component to Address Remote Code Execution - Windows Server 2008 R2 SP1 / Windows 7
- MS15-130: Security Update for Microsoft Uniscribe to Address Remote Code Execution - Windows Server 2008 R2 SP1 - KB3108670 (x64)
- MS16-004: Security Update for Microsoft Office to Address Remote Code Execution - Office 2010 SP2 - KB3114553
- MS16-005: Security Update for Windows Kernel-Mode Drivers to Address Remote Code Execution - Windows Server 2008 R2 SP1 - KB3124000
- MS16-006: Security Update for Silverlight to Address Remote Code Execution - Silverlight 5 Developer Runtime - KB3126036 (x64)

At the bottom of the window, there are checkboxes for 'Elevate CPU while processing' (checked), 'Sort Results' (checked), and 'Continuously Evaluation' (unchecked). An 'Evaluate' button is on the right. The status bar at the bottom left shows 'Items: 10' and the bottom right shows 'Evaluation time: 00:00:03.011'.

Added Content – Not Presented.



Server Side API's



BigFix Server APIs

API	Execute Against	Language / Interface	Read or Write	Popularity (10 – high, 1 – low)	Demo / Uploaded
REST API (Platform)	BigFix Server	Any Language / HTTPS	Read / Write	10	Yes / No
REST API (Inventory)	Inventory Server	Any Language / HTTPS	Read / Write	3	No / No
REST API (SCA)	Security Compliance Analytics Server	Any Language / HTTPS	Read / Write	3	No / No
Platform Server API	BigFix Server	Any Language / MS COM	Write	4	Yes / Yes
Database API	BigFix Database	SQL / (ODBC, ADO, JDBC)	Read	3	Yes / Yes
SOAP API	Web Reports	Session Relevance / SOAP	Read	5	Yes / Yes
Dashboard API	BigFix Console	Session Relevance / -	Read / Write	2	Yes / No

- XML based SOAP API for querying objects in the BES Web Reports
- Results returned as XML documents
- Used only for reading

SOAP API – Example Session Relevance Tester

The screenshot displays the BigFix Session Relevance Tester application window. The title bar reads "Fixlets - Critical MS patches last 30 days.bsr - BigFix Session Relevance Tester". The menu bar includes File, Edit, Format, View, Tools, Export, and Help. The toolbar contains icons for Evaluate, New, Open, Save, Print, Cut, Copy, Paste, Excel, Grid Results, HTML Results, Max Rows (1000), Sort, Split, Indent, and Flatten. Below the toolbar are tabs for Session Relevance, Configurations, and Inspector Reference.

The main text area contains the following search query:

```
1 // All Microsoft critical patches released within the last 30 days
2
3 names of bes fixlets whose (
4   name of site of it = "Enterprise Security" and
5   source severity of it = "Critical" and
6   (current date - source release date of it) < 30*day
7   and name of it as lowercase does not contain "corrupt")
```

Below the query is a "Results" pane showing a list of 46 items returned. The results are as follows:

- MS16-001, MS16-002, MS16-005, MS16-007, MS16-008, 3118753: Cumulative Update for Windows 10 - Windows 10 - KB3124266
- MS16-001, MS16-002, MS16-005, MS16-007, MS16-008, 3118753: Cumulative Update for Windows 10 - Windows 10 - KB3124266 (x64)
- MS16-001, MS16-002, MS16-005, MS16-007, MS16-008, 3118753: Cumulative Update for Windows 10 - Windows 10 Version 1511 - KB3124263
- MS16-001, MS16-002, MS16-005, MS16-007, MS16-008, 3118753: Cumulative Update for Windows 10 - Windows 10 Version 1511 - KB3124263 (x64)
- MS16-001: Cumulative Security Update for Internet Explorer - Windows 7 SP1 - IE 10 - KB3124275
- MS16-001: Cumulative Security Update for Internet Explorer - Windows 7 SP1 - IE 10 - KB3124275 (x64)
- MS16-001: Cumulative Security Update for Internet Explorer - Windows 7 SP1 - IE 11 - KB3124275
- MS16-001: Cumulative Security Update for Internet Explorer - Windows 7 SP1 - IE 11 - KB3124275 (x64)
- MS16-001: Cumulative Security Update for Internet Explorer - Windows 7 SP1 - IE 8 - KB3124275
- MS16-001: Cumulative Security Update for Internet Explorer - Windows 7 SP1 - IE 8 - KB3124275 (x64)
- MS16-001: Cumulative Security Update for Internet Explorer - Windows 7 SP1 - IE 9 - KB3124275
- MS16-001: Cumulative Security Update for Internet Explorer - Windows 7 SP1 - IE 9 - KB3124275 (x64)
- MS16-001: Cumulative Security Update for Internet Explorer - Windows 8 Gold - IE 10 - KB3124275
- MS16-001: Cumulative Security Update for Internet Explorer - Windows 8 Gold - IE 10 - KB3124275 (x64)
- MS16-001: Cumulative Security Update for Internet Explorer - Windows 8.1 Gold - IE 11 - KB3124275
- MS16-001: Cumulative Security Update for Internet Explorer - Windows 8.1 Gold - IE 11 - KB3124275 (x64)
- MS16-001: Cumulative Security Update for Internet Explorer - Windows Vista SP2 - IE 7 - KB3124275

The status bar at the bottom indicates "Results: 46 items returned" and "Evaluation time: 00:00:00.561 | Connected to tintin:52312 as leewei - Web Reports Version: 9.2.6.94".

REST API

- Perform the majority of tasks present in the console via a standardized and operating system independent method
- Communicates over HTTPS
- Results in either XML or JSON
- The only API that allows performing
 - Visibility / read functions, e.g. get info
 - Control / write functions, e.g. take actions

REST API example


The screenshot displays a Microsoft Excel spreadsheet titled 'Book1 - Microsoft Excel' with the 'IBM BigFix' ribbon active. The spreadsheet shows a table of BES Computers with columns for Computer Name and CPU. A dialog box titled 'Attributes Available for BES Computers:' is open, showing a list of attributes with checkboxes. The 'Selected:' count is 11. The spreadsheet data is as follows:

Computer Name	CPU
CSDM2	3.60 GHz Intel Core i5-35'
Fern's MacBook Pro	3.60 GHz Intel Core i5-35'
leiva	AMD Phenom II X2 3.1 GH
WIN-DPS77S3HT13	3.90 GHz Intel Core i7-471
2003-SE-SERVER	3.60 GHz Intel Core i5-34'
MINILAT	3.20 GHz Intel Core i7-55'
SUADELL	AMD Phenom II X2 3.1 GH
FernMac	3.90 GHz Intel Core i7-471
torres	3.60 GHz Intel Core i5-35'
PENANG	2700 MHz Core i7-3740Q
Aberlard-164406	AMD Phenom II X2 3.1 GH
Aberlard-889316	3.60 GHz Intel Core i5-35'
Ambrose-701776	3.90 GHz Intel Core i7-471
Anslern-070597	AMD Phenom II X2 3.1 GH
Anslern-469620	AMD Phenom II X2 3.1 GH
Antisthenes-035464	3.20 GHz Intel Core i7-56'
Antisthenes-786743	3.20 GHz Intel Core i7-56'
Aristotle-364943	3.60 GHz Intel Core i5-34'
Aristotle-581731	3.60 GHz Intel Core i5-34'
Aristotle-609164	3.20 GHz Intel Core i7-55'
Augustine-453055	3.60 GHz Intel Core i5-35'
Augustine-600400	AMD Phenom II X2 3.1 GH
Augustine-948180	3.90 GHz Intel Core i7-471
Aurelius-142246	3.20 GHz Intel Core i7-56'


The dialog box 'Attributes Available for BES Computers:' shows the following selected attributes:

- Global Properties
- Active Directory Path
- Agent Type
- Agent Version
- Attachmate Service installed
- BES Relay Selection Method
- BES Relay Service Installed
- BES Root Server
- BIOS
- Client Administrators
- Client Settings
- Computer Name
- Computer Type
- CPU
- Current User
- Device Type
- Distance to BES Relay
- DNS Name
- Free Space on System Drive
- ID

The dialog box also shows a list of attributes on the right, including Computer Name, CPU, Device Type, Distance to BES Relay, DNS Name, IP Address, Last Report Time, OS, RAM, Subnet Address, and Total Size of System Drive. The 'Selected:' count is 11. The dialog box has buttons for 'Top', 'Up', 'Down', 'Bottom', 'Select All', 'Unselect All', 'Expand All', '< Back', 'Next >', and 'Cancel'. The spreadsheet shows a table with columns for Last Report Time and OS, with data for various computers and their last report times and operating systems.



REST Troubleshooting : How To Demonstration



Rest API

- Simple to implement
 - One URL to submit queries
 - One URL to retrieve results, with the paging capability
- Best documentation for Query REST API

[Link](#) or [Developer.BigFix.com](#)

More Help!

- <https://localhost:52311/api/help>

More Help?

- <https://localhost:52311/api/help/object>

- <https://localhost:52311/api/help/clientquery>

- <https://localhost:52311/api/help/action>

- <https://localhost:52311/api/help/action/{i}>

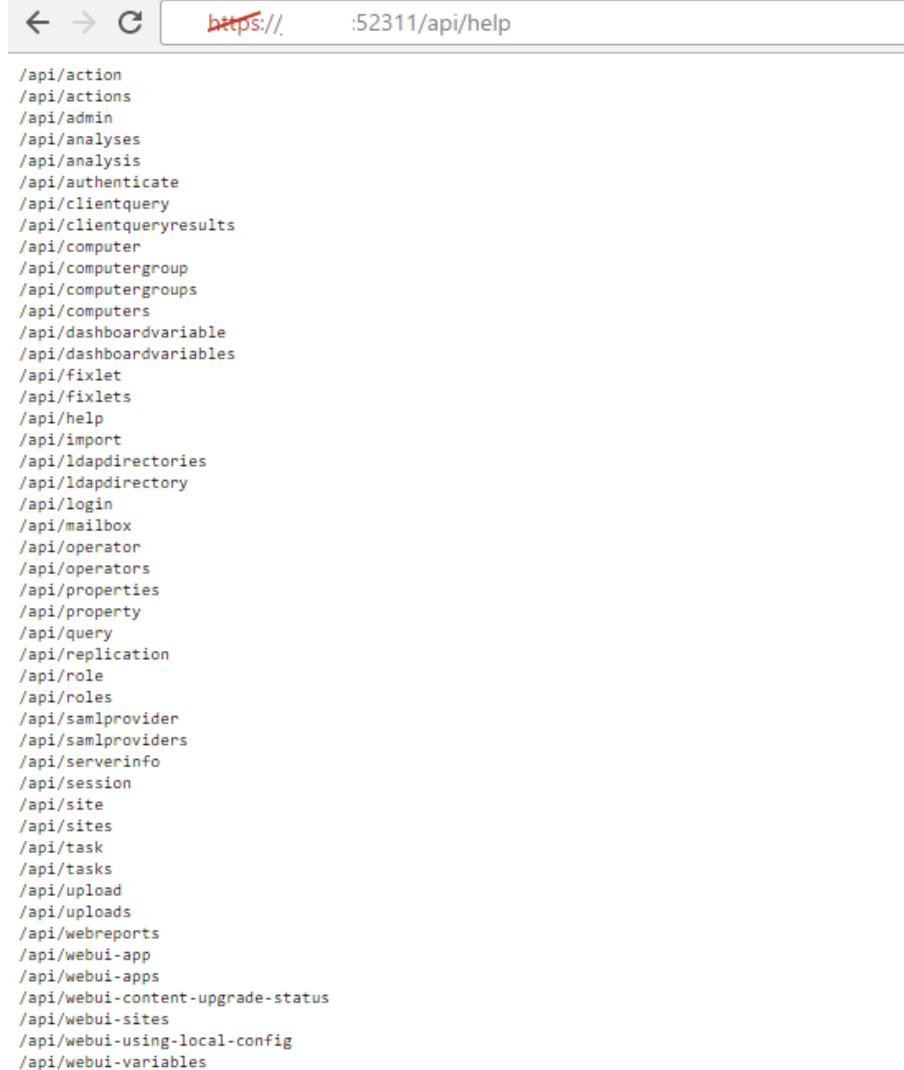


GET:

`/api/clientquery/{id}`

POST:

`/api/clientquery`





Example Applications made with REST



BigFix Query Tester

- Syntax highlighted Relevance statements
 - Return multiple row results as one unit
 - Count unique occurrences of the results
 - Use any Relevance statements from properties, analyses, and Fixlets
 - Query history
 - Experimental Query Builder
-
- <http://leewei.com/bigfix/prod/query/BigFixQueryTesterV2.0.zip>

BigFix Query Tester

The screenshot displays the BigFix Query Tester application window. The title bar reads "BigFix Query Tester". The menu bar includes "Query", "Find Relevance", "Query Builder", "Inspector Reference", "API", "Show Details", "History", and "Configurations and Settings". The toolbar contains "Build (Ctrl-B)", "Execute Local (Ctrl-Enter)", "Copy Relevance (Ctrl-Q)", and "Wrap Results (Ctrl-W)".

Find Inspector

Select Inspector:
Select Creation Method:
Enter Value:

Select All Unselect All

- Io Write Count Of <Process>: Integer
- Io Write Size Of <Process>: Integer
- Kernel Time Of <Process>: Time Interval
- 0/1 Nx Bit Of <Process>: Boolean
- Page Fault Count Of <Process>: Integer
- Page File Usage Of <Process>: Integer
- Peak Page File Usage Of <Process>: Integer
- Peak Working Set Size Of <Process>: Integer
- Name Of <Process>: String
- Pid Of <Process>: Integer
- User Of <Process>: Security Identifier
- Ppid Of <Process>: Integer
- Process Id Of <Process>: Integer
- Quota Nonpaged Pool Usage Of <Process>: Integer
- Quota Paged Pool Usage Of <Process>: Integer

Add Filter

Name starts with
String

Filters Are:

Property	Operator	Value
Name	starts with	bes

Relevance

```
{ name of it | "n/a",  
  (pid of it) as string | "n/a",  
  (user of it) as string | "n/a" }  
of processes whose (  
  name of it as lowercase starts with "bes"  
)
```

Local QNA Results

Rows Returned: Evaluation Time:

```
A: BESRootServer.exe, 4716, NT AUTHORITY\SYSTEM  
A: BESGather.exe, 4904, NT AUTHORITY\SYSTEM  
A: BESWebReportsServer.exe, 6716, NT AUTHORITY\SYSTEM  
A: BESClient.exe, 1236, NT AUTHORITY\SYSTEM  
A: BESClientUI.exe, 5016, MAZE\leewei  
A: BESConsole.exe, 4692, MAZE\leewei
```

Query completed locally IBM BigFix Version: 9.5.3.211

REST API – CVE Dashboard

- In general this is how it works:
- There is a command line utility that is scheduled via a Fixlet. You can also run it manually.
- The utility downloads any CVEs from the National Vulnerability Database (NVD) if there are corresponding Fixlets.
- The Console Dashboard is then used to browse and search the data.

[Link to the CVE Dashboard on IBM X-Force AppExchange](#)

REST API – CVE Dashboard

National Vulnerability Database CVE Dashboard v1.3

2603 of 2603 items

 Data imported: 2016-06-04 09:20:01 -07:00

CVE ID	Published Date	Source	CVSS Score	Related Fixlets	Vulnerable Computers	Total Computers	Cumulative Score	CVE Compliance	Summary
CVE-2013-2426	2013-04-17	Oracle oval.mitre.org	9.3	12	175	615	1628	71.5%	Unspecified vulnerability in the Java Runtime Environment (JRE) component in Oracle Java SE 7 Update 17 and earlier, and OpenJDK 6 and 7, allows remote attackers to affect confidentiality, integrity, and availability via unknown vectors related to Libraries. NOTE: the previous information is from the April 2013 CPU. Oracle has not commented on claims from another vendor that this issue is related to incorrect invocation of the defaultReadObject method in the ConcurrentHashMap class, which allows remote attackers to bypass the Java sandbox.
CVE-2013-2421	2013-04-17	Oracle oval.mitre.org	9.3	12	175	615	1628	71.5%	Unspecified vulnerability in the Java Runtime Environment (JRE) component in Oracle Java SE 7 Update 17 and earlier, and OpenJDK 6 and 7, allows remote attackers to affect confidentiality, integrity, and availability via unknown vectors related to HotSpot. NOTE: the previous information is from the April 2013 CPU. Oracle has not commented on claims from another vendor that this issue is related to incorrect MethodHandle lookups, which allows remote attackers to bypass Java sandbox restrictions.
CVE-2013-2436	2013-04-17	Oracle oval.mitre.org	9.3	12	175	615	1628	71.5%	Unspecified vulnerability in the Java Runtime Environment (JRE) component in Oracle Java SE 7 Update 17 and earlier, and OpenJDK 7, allows remote attackers to affect confidentiality, integrity, and availability via unknown vectors related to Libraries, a different vulnerability than CVE-2013-1488 and CVE-2013-2426. NOTE: the previous information is from the April 2013 CPU. Oracle has not commented on claims from another vendor that this issue is related to "incorrect "type checks" and "method handle binding" involving Wrapper.convert.
CVE-2011-3551	2011-10-19	Apple Oracle Red Hat oval.mitre.org	9.3	23	310	559	2883	44.5%	Unspecified vulnerability in the Java Runtime Environment component in Oracle Java SE JDK and JRE 7, 6 Update 27 and earlier, and JRockit R28.1.4 and earlier allows remote attackers to affect confidentiality, integrity, and availability via unknown vectors related to 2D.
CVE-2011-4109	2012-01-05	Apple IBM VMware, Inc. oval.mitre.org	9.3	9	6	526	55.8	98.9%	Double free vulnerability in OpenSSL 0.9.8 before 0.9.8s, when X509_V_FLAG_POLICY_CHECK is enabled, allows remote attackers to have an unspecified impact by triggering failure of a policy check.
CVE-2013-5850	2013-10-16	Apple IBM oval.mitre.org	9.3	6	5	526	46.5	99.0%	Unspecified vulnerability in Oracle Java SE 7u40 and earlier, Java SE 6u60 and earlier, Java SE 5.0u51 and earlier, and Java SE Embedded 7u40 and earlier allows remote attackers to affect confidentiality, integrity, and availability via unknown vectors related to Libraries.

REST API – Auto Patch

- AutoPatch Definition Creates Baselines and Actions Automatically.
- 1 Definition can be run on a schedule to create Actions and Baselines

- Download Available:
 - Link [here](#)
 - Md5s /SHA's / etc.- [here](#)

AutoPatch Definition Creator

File Help

Login info AutoPatch Definition Select Site(s) Fxlet Filter Fxlet Filter (2)

Include Fxlets by OS Name (windows only):
 Include Fxlets whose name contains:
 Exclude Fxlets whose name contains :
 Filter Fxlets based on Source Severity

Include these source Severities :

- <unspecified>
- critical
- important
- low
- moderate

▶

Instruction: Step 5 - Select Fxlet Filter details regarding your AutoPatch Definition

AutoPatch Definition Creator

File Help

Login info AutoPatch Definition Select Site(s)

Step 3 - Select Site (s) :

- Patches for CentOS 7
- Patches for Mac OS X
- Patches for Oracle Linux 7
- Patches for RHEL 7
- Patches for Windows
- Updates for Mac Applications
- Updates for Windows Applications

▶

Instruction : Step 3 - Please Select the site(s) for this AutoPatch Definition.

AutoPatch Definition Creator

File Help

Login info AutoPatch Definition Select Site(s) Fxlet Filter

AutoPatch Definition - Fxlet Filter

- Include fxlets with source release date in the last days
- Exclude fxlets with source release date in the last days
- Exclude Fxlets in Auto Deploy Baselines
- Exclude Fxlets with an Open Action
- Exclude Fxlets that have no default action
- Exclude Fxlets marked Corrupt
- Excludes Fxlets marked Superceded
- Exlude Fxlets that have 0 applicable machines

▶

Instruction: Step 4 - Select Fxlet Filter details regarding your AutoPatch Definition

AutoPatch Definition Creator

File Help

Login info AutoPatch Definition Select Site(s) Fxlet Filter Fxlet Filter (2) Execution

AutoPatch Definition Action Schedule - Baseline (and/or) Action

Daily @ 00:01:00

Target Action Constraints

- Action Starts on : AutoPatch Exec + 0 days, at 00:01:00 client local time
- Action Ends on : AutoPatch Exec + 30 days, at 00:01:00
- Run Between : 00:01:00 and 00:03:00
- Run Only on : Sun Mon Tue Wed Thu Fri Sat
- Run Only When : [] [] [] [] [] []

Action Behavior

- Start client downloads before constraints are satisfied.
- Reapply this action whenever it becomes relevant

▶

Instruction: Step 6 - Enter When the AutoPatch Definition should execute, if you selected 'Create Actions From Definition' the action settings section will define schedule constraint of the created action

AutoPatch Definition Creator

File Help

Login info AutoPatch Definition

AutoPatch Definition Name : Auto Patch Dention for Periodic Action

Publishing site : ActionSite

- Create baselines from definition
- Create actions from definition

AutoPatch Definition Description :

This is a default description. This is a windows patch subscription directed at patching all critical patches released in the last 30 days.... it will be run Weekly... and it will have...

▶

Informational - Connection Successful with user jgo. Connection to : https://localhost:52311/api/login

Instruction: Step 2 - Enter details on your AutoPatch Subscription. Name, Description, Select Site (NOTE: It is not recommended to publish to ActionSite.)

AutoPatch Definition Creator

File Help

Login info AutoPatch Definition Select Site(s) Fxlet Filter Fxlet Filter (2) Execution Targeting Save Definition

Site Name	Fxlet ID	Fxlet Name
Patches for Windows	1614101	MS16-141: Security Update for Adobe Flash Player - Windows 10 - Adob
Patches for Windows	1614103	MS16-141: Security Update for Adobe Flash Player - Windows 10 Version
Patches for Windows	1614105	MS16-141: Security Update for Adobe Flash Player - Windows 10 Version
Patches for Windows	319787301	MS16-130, MS16-131, MS16-132, MS16-134, MS16-135, MS16-137, MS
Patches for Windows	319787401	MS16-130, MS16-131, MS16-132, MS16-134, MS16-135, MS16-137, MS
Patches for Windows	319858503	MS16-129, MS16-130, MS16-131, MS16-132, MS16-134, MS16-135, MS
Patches for Windows	319858603	MS16-129, MS16-130, MS16-131, MS16-132, MS16-134, MS16-135, MS

▶

Action.exe -username=jgo -password=bigfix -server=localhost -port=52311 -file="C:\Users\jgo\Box Sync\AutoPatch\EXE\01_Current\AUTO_PATCH_DEFINITION_FOR_PERIODIC_ACTION\Monthly_1st_Monday_00_01_00.xml"

Remember to change password from [Blank] to actual password.






Demonstrations





THANK YOU

FOLLOW US ON:

-  ibm.com/security
-  securityintelligence.com
-  xforce.ibmcloud.com
-  [@ibmsecurity](https://twitter.com/ibmsecurity)
-  youtube.com/user/ibmsecuritysolutions

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