

Dr. Alan's IBM i Web Checkup

Alan Seiden



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Founder of Club Seiden community

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IBM **CHAMPION** 



Roadmap

Tips for fast, reliable web applications

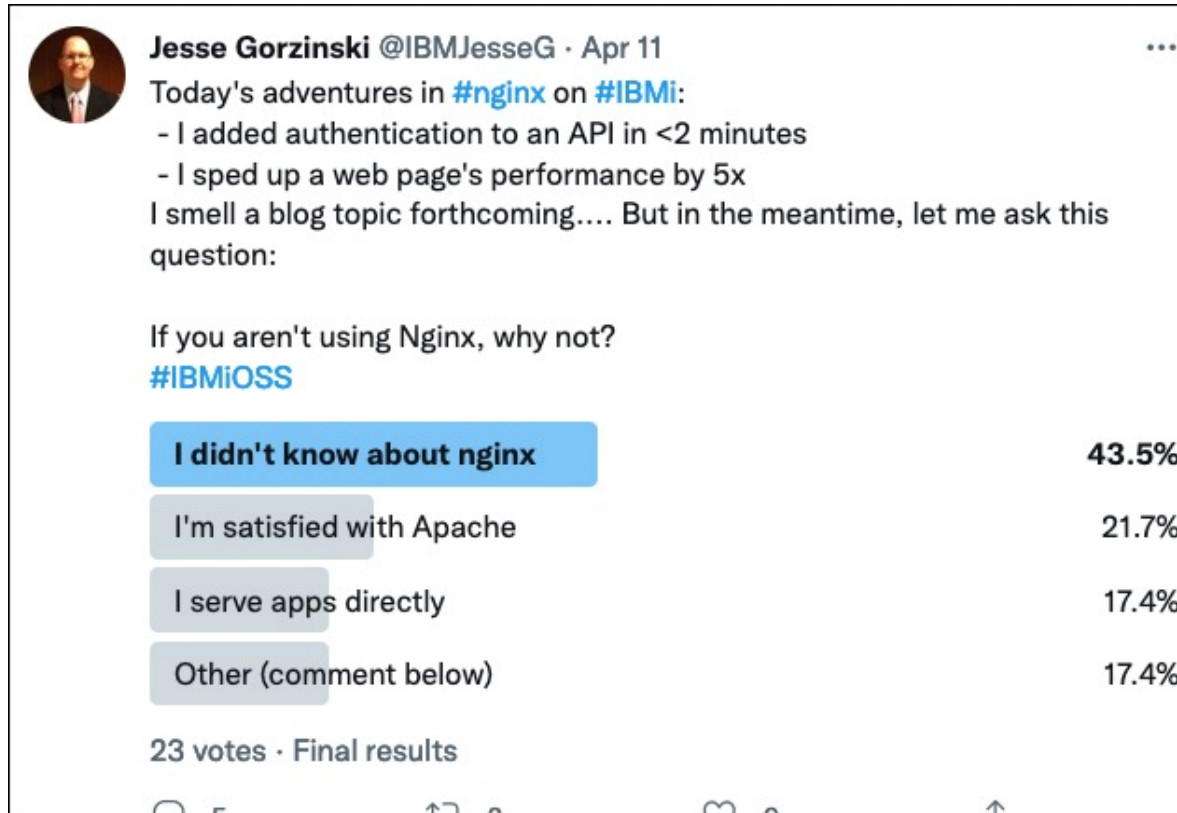
- ◆ What's on the Doctor's Mind
- ◆ ODBC driver and tips
- ◆ SQL and Db2 boosts
- ◆ Security requirements
- ◆ Choices, decisions, conundrums, and opportunities 😊
- ◆ Future-proofing
- ◆ Q&A



On Doctor's Mind



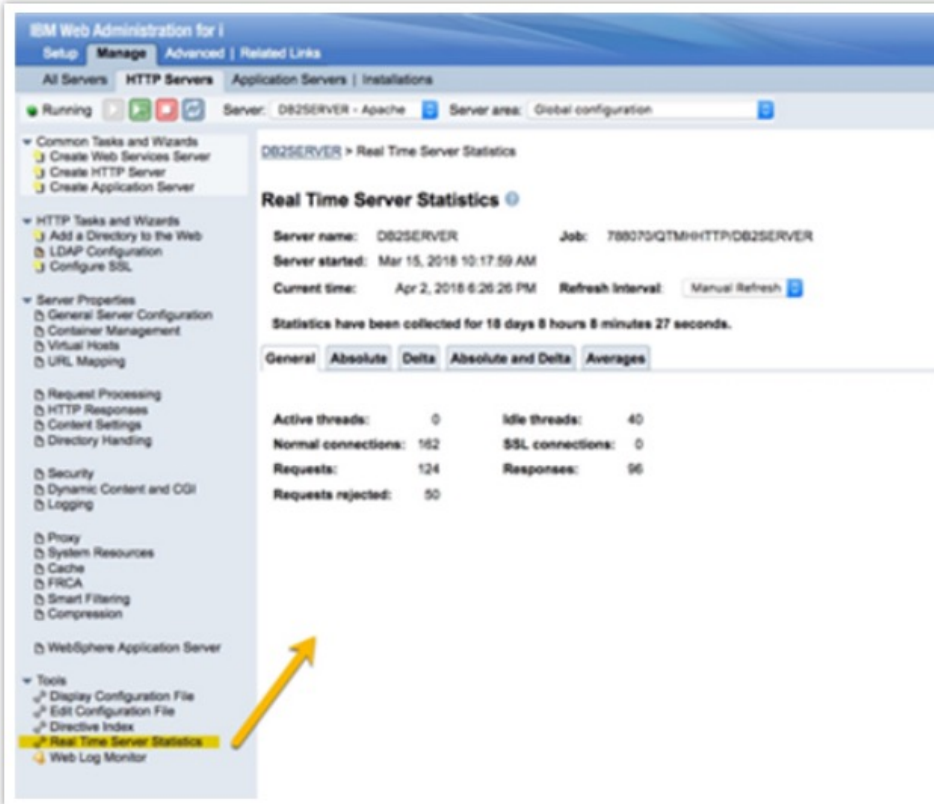
Nginx, Apache, no web server?



Compare to Dr. Alan's claim in a recent presentation...

“Apache web server is a solid solution”

- ◆ Apache has IBM SWMA support, integration, and tools
- ◆ Example: real-time server statistics



The screenshot displays the IBM Web Administration console for Apache. The interface includes a navigation menu on the left with categories like 'Common Tasks and Wizards', 'HTTP Tasks and Wizards', 'Server Properties', and 'Tools'. The 'Tools' section is expanded, and 'Real Time Server Statistics' is highlighted with a yellow arrow. The main content area shows the 'Real Time Server Statistics' for the 'DB2SERVER' instance. It includes details such as 'Server name: DB2SERVER', 'Job: 78807DQTMHHTTPDB2SERVER', 'Server started: Mar 15, 2018 10:17:59 AM', and 'Current time: Apr 2, 2018 6:26:26 PM'. A table below provides a summary of server metrics:

Real Time Server Statistics	
Active threads:	0
Idle threads:	40
Normal connections:	162
SSL connections:	0
Requests:	124
Responses:	96
Requests rejected:	50

Apache... more

- ◆ STRTCPSVR and ENDTCPSPVR commands help manage web server instances
- ◆ Standard locations of instance definitions
 - ◆ /QSYS.LIB/QUSRSYS.LIB/QATMHINSTC.FILE/mywebsite.MBR
- ◆ Graphical and non-graphical tools
- ◆ Collection services can gather data
 - ◆ And real-time: **select * from QSYS2.HTTP_SERVER_INFO**
- ◆ ThreadsPerChild 40 is a reasonable choice
- ◆ One downside – does not run in chroot containers

New generation: “I don’t like web servers”

- ◆ “I like node.js (same with Python) because I can ‘stand up’ an application without needing a web server”
- ◆ Is that true?
 - ◆ PHP can run standalone but we like Apache or nginx for production.
- ◆ We who grew up configuring Apache think it’s easy (except for rewrite rules)
- ◆ Won’t we need a web server at some point even as a proxy ?
- ◆ Developer flexibility vs. admin structure

Remember to configure it for production

- ◆ I found this default php-fpm config yesterday along with nginx
- ◆ Why were PHP jobs ending and restarting, with high CPU load?

```
pm = dynamic
```

```
pm.max_children = 5
```

```
pm.start_servers = 2
```

```
pm.min_spare_servers = 1
```

```
pm.max_spare_servers = 3
```

- ◆ This default config was for a range of 3-5 jobs.
- ◆ I changed it to a steady 20 jobs that stayed running

```
pm = static
```

```
pm.max_children = 20
```

Configure... continued

- ◆ Nginx had the opposite settings (4000-8000 web connections)
- ◆ This allowed in a lot of spam requests

```
worker_processes 4;          # set equal to number of CPU cores `WRKSYSACT`  
  
worker_rlimit_nofile 4000;  # set to double the worker connections  
  
events {  
  
    worker_connections 2000;  
  
}
```

Configure Apache as well

- ◆ Defaults are reasonable
- ◆ Check out this article by Dr. Alan
 - ◆ <https://www.itjungle.com/2018/12/03/guru-right-size-your-php/>
- ◆ Discusses PHP and Apache to “Right-size” your application
- ◆ ThreadsPerChild and PHP children

- ◆ Other items – how could Java threads affect you ? “I don’t use Java”

New HTTP functions for Db2

- ◆ New set of HTTP functions that can replace the Java-based Db2 HTTP functions (httpgetclob etc.).
- ◆ These work faster than the Java functions and don't require starting a JVM.
 - ◆ These functions run from a service program QSYS2 rather than from Java in SYSTOOLS.
 - ◆ Available in IBM i Technology Refresh 5 (TR5).
 - ◆ **WRKOBJ QSYS/QSQAXISC** to see if you have it
 - ◆ Details: <https://www.ibm.com/support/pages/node/6486889>

What job am I in? Db2 helps

- ◆ Get full job name of current job

- ◆ `SELECT JOB_NAME FROM
TABLE(QSYS2.ACTIVE_JOB_INFO(JOB_NAME_FILTER =>
'*'))`

- ◆ Get joblog of current job

- ◆ `select * from table(QSYS2.JOBLOG_INFO('*'))`

- ◆ Very handy from PHP / Python / Node database connections

TLS? SSL? Office 365 and more

- ◆ TLS is a sort of update to SSL, so we're using the term **TLS** now.
- ◆ Providers such as Office 365 are starting to enforce TLS 1.2
- ◆ If you have old software that had an old version of OpenSSL built in, you need to update your software.
- ◆ Newer PASE software (e.g. newer PHP, Node, Python) relies on IBM i's built-in OpenSSL now
- ◆ You get the benefit of IBM's frequent OpenSSL updates via Yum/RPM

Curl is cool

- ◆ Curl is a tool that runs on a PASE command line and can do all kinds of miraculous things across the internet
- ◆ A favorite: test an SMTP email server.
- ◆ `curl smtp://mail.mybeverage.com -v --mail-from ebyz@mybeverage.com --mail-rcpt ebyz@alanseiden.com --upload-file myemail.txt`

- ```
Trying 10.10.11.31...
TCP_NODELAY set
< 220 Exchange2019-E1.mybeverage.com Microsoft ESMTP MAIL Service ready at Sun, 27 Jun 2021 12:03:31 -0400
> EHLO MYSERV_1112534876.ord
< 250-Exchange2019-E1.mybeverage.com Hello [10.10.11.41]
```


# Curl tip on IBM i

- ◆ “getaddrinfo() thread failed to start”
- ◆ Updated version of curl running in QP2SHELL, or in QSH without the proper multithreading variable being set.
- ◆ Please switch from QP2SHELL to QSH and set QIBM\_MULTI\_THREADED to Y
- ◆ Also applies to PHP and other languages using curl
- ◆ <https://www.seidengroup.com/2021/07/08/solving-getaddrinfo-thread-failed-to-start/>
- ◆ `ADDENVVAR ENVVAR(QIBM_MULTI_THREADED)  
VALUE(Y) REPLACE(*YES)`



# Some technology choices today

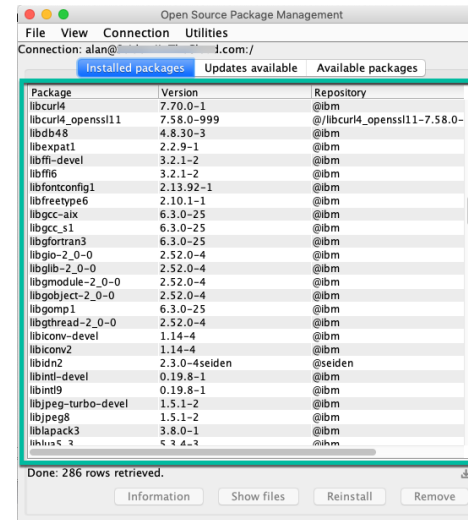
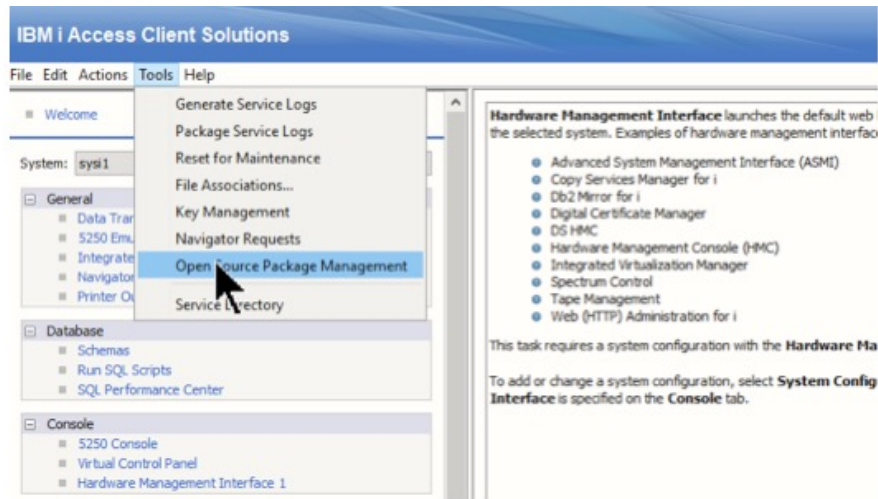
- ◆ Buy/rent/cloud
- ◆ Custom applications -- develop with help from commercial tools
- ◆ Custom applications: -- develop using open source or hybrid
- ◆ Back end / front end – are those separate?
  - ◆ Javascript frameworks ... Angular / React / Vue / new ones!!
  - ◆ Back end... PHP / Python / Node / other
  - ◆ Watch out for AJAX overload
  - ◆ API



# Open source setup and speed tips

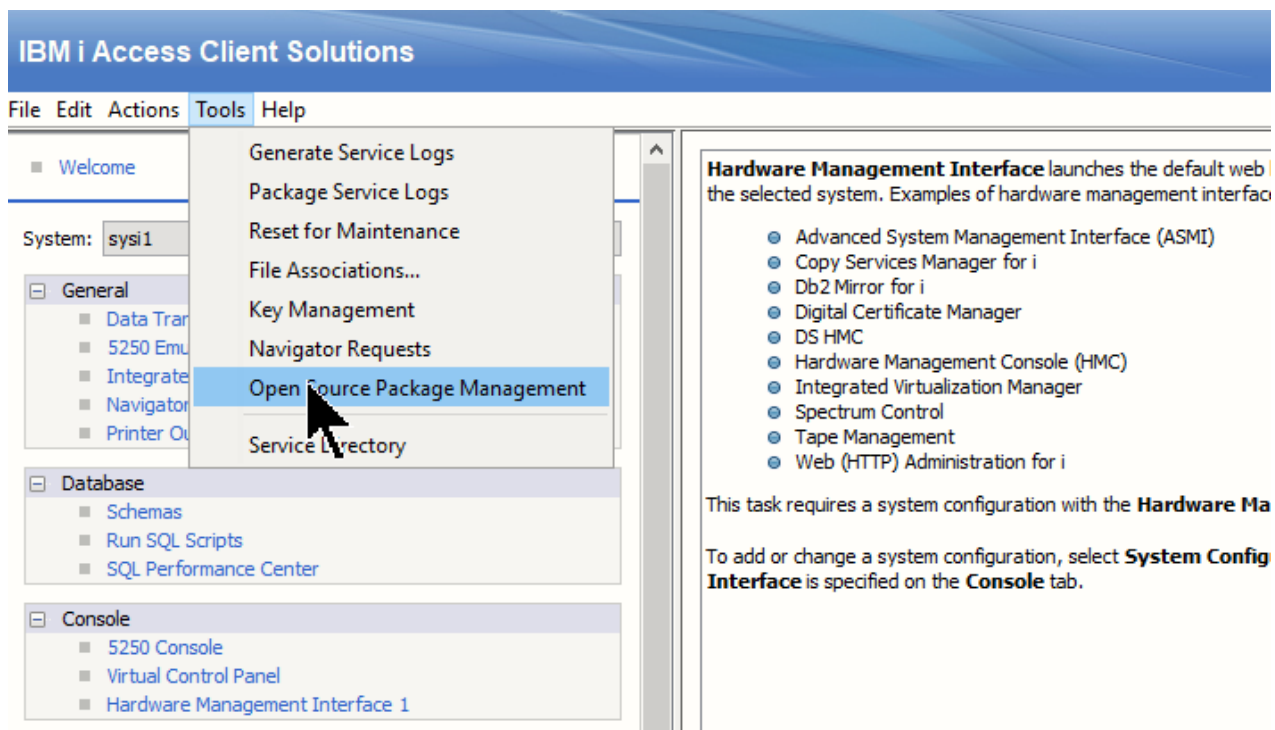
# Setting up Yum

- ◆ Make sure Yum and the Open Source Package Management window of ACS are set up
  - ◆ <https://www.seidengroup.com/php-documentation/how-to-set-up-the-ibm-i-open-source-environment/>



# Install open source environment

- ◆ IBM i SSH server service must be running on port 22



The screenshot displays the IBM i Access Client Solutions interface. The title bar reads "IBM i Access Client Solutions". Below it is a menu bar with "File", "Edit", "Actions", "Tools", and "Help". The "Tools" menu is open, showing a list of options: "Generate Service Logs", "Package Service Logs", "Reset for Maintenance", "File Associations...", "Key Management", "Navigator Requests", "Open Source Package Management" (highlighted with a mouse cursor), and "Service Directory".

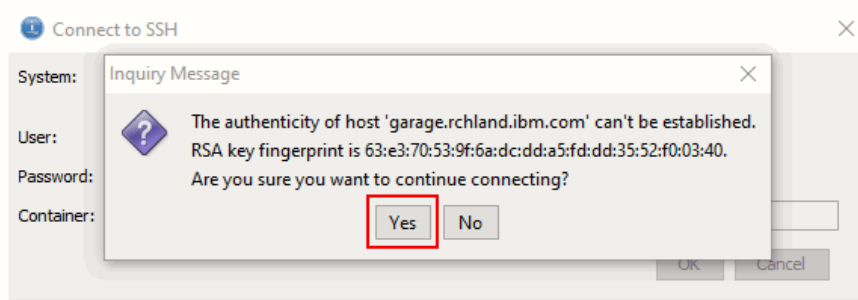
On the left side, there is a navigation pane with a "System:" dropdown set to "sysi1". Below it are several expandable sections: "General" (containing "Data Tran...", "5250 Emu...", "Integrate...", "Navigator", and "Printer O..."), "Database" (containing "Schemas", "Run SQL Scripts", and "SQL Performance Center"), and "Console" (containing "5250 Console", "Virtual Control Panel", and "Hardware Management Interface 1").

On the right side, there is a text area titled "Hardware Management Interface" which states: "Hardware Management Interface launches the default web interface for the selected system. Examples of hardware management interfaces include:" followed by a bulleted list of services: "Advanced System Management Interface (ASMI)", "Copy Services Manager for i", "Db2 Mirror for i", "Digital Certificate Manager", "DS HMC", "Hardware Management Console (HMC)", "Integrated Virtualization Manager", "Spectrum Control", "Tape Management", and "Web (HTTP) Administration for i". Below this list, it says: "This task requires a system configuration with the Hardware Management Interface specified on the Console tab. To add or change a system configuration, select System Configuration on the Console tab."

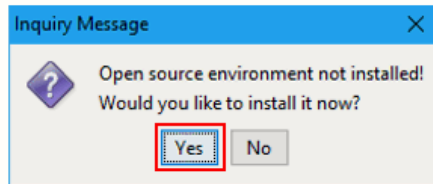
# Open Source Environment – done!

- ◆ You may receive these prompts. Just say Yes !

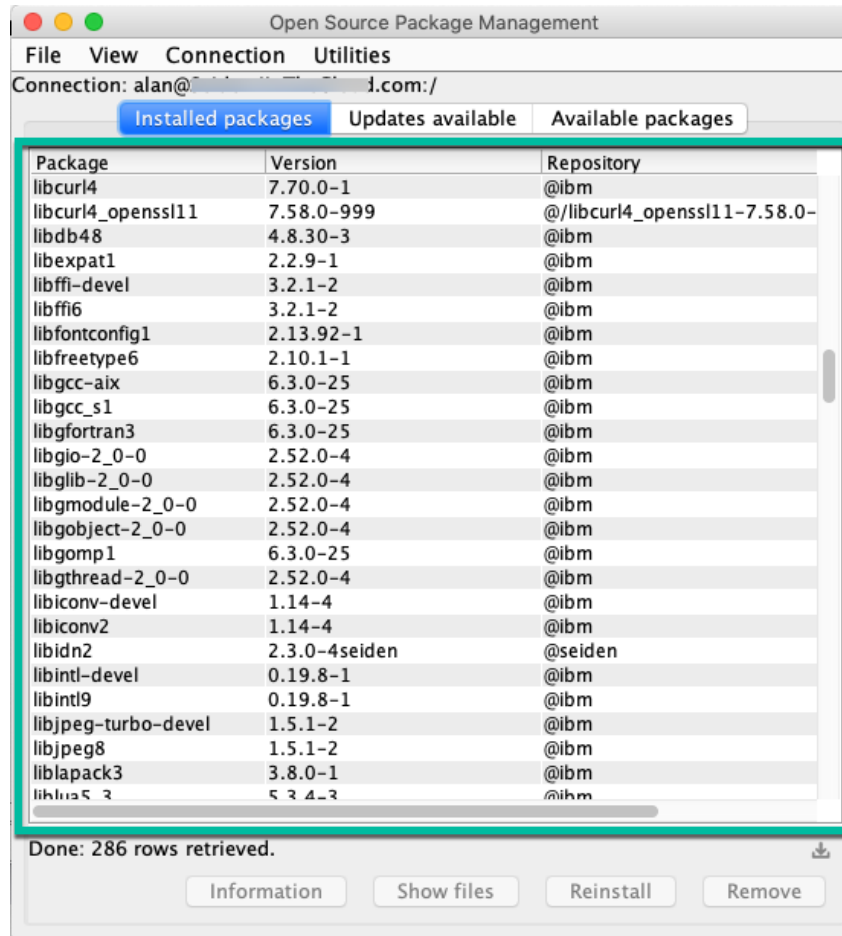
If you receive the following warning, select "Yes" to continue.



If the underlying Open Source Package Management YUM utility is not already installed, the following message is displayed. Respond with "Yes" and the environment installs.



# You can now see default IBM packages



# Remember gzip / mod\_deflate

- ◆ Instant speed improvement if you don't have it yet
- ◆ Included in our siteadd setup

```
Load the extension that deflates (compresses) content
LoadModule deflate_module /QSYS.LIB/QHTTPSVR.LIB/QZSRCORE.SRVPGM
```

```
Specify what content to compress (example: html, json, css, javascript)
AddOutputFilterByType DEFLATE application/x-httpd-php application/json
text/css application/x-javascript application/javascript text/html
```

- ◆ **Details:**
  - ◆ [https://www.seidengroup.com/2021/10/12/speed-up-web-pages-using-apaches-mod\\_deflate/](https://www.seidengroup.com/2021/10/12/speed-up-web-pages-using-apaches-mod_deflate/)

# If REALLY slow – look for network issue

- ◆ E.g. consistent 5 seconds for a simple page
- ◆ Could it be DNS setup?
- ◆ Find out using **curl** tool (comes with IBM open source packages).
- ◆ <https://blog.josephscott.org/2011/10/14/timing-details-with-curl/>  
`curl [options] https://mysite.com`
- ◆ **time\_namelookup: 5.000**  
time\_connect: 0.037  
time\_appconnect: 0.000  
time\_pretransfer: 0.037  
time\_redirect: 0.000  
time\_starttransfer: 0.092  
time\_total: 5.164
- ◆ This was a five-second timeout for an incorrect DNS server name





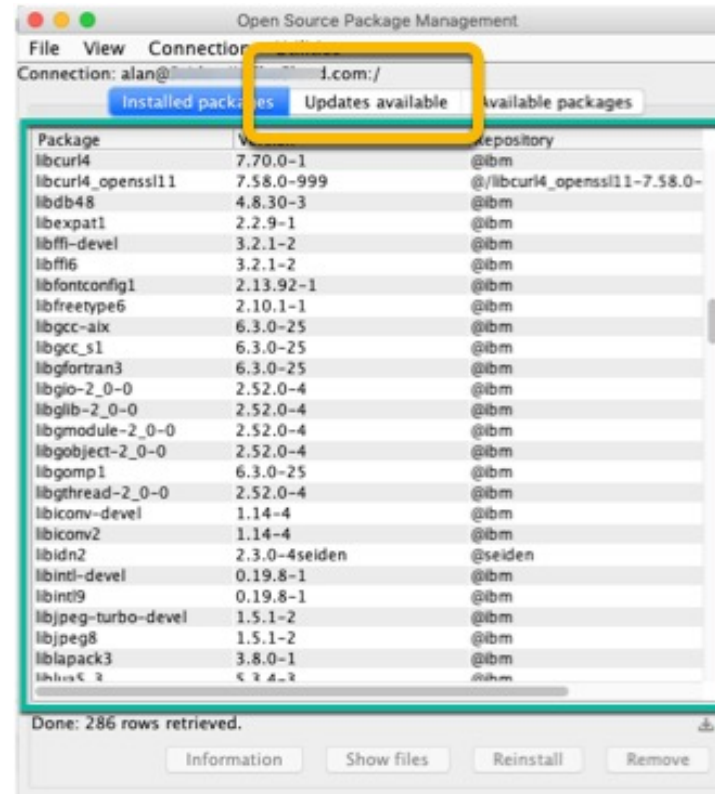
A group of six diverse office professionals (three women and three men) are smiling and gathered around a conference table. They are in an office setting with a computer monitor displaying a video call in the background. The image is overlaid with a semi-transparent dark blue filter.

Update Easily and Often



# Easy updates using Yum

- ◆ Use the yum command:
  - ◆ yum update
- ◆ Or ACS “Updates available” tab
- ◆ Changelog
  - ◆ <https://www.seidengroup.com/communityplus-php-changelog/>



# “yum update” command

| Package       | Version        | Repository       |
|---------------|----------------|------------------|
| Updating:     |                |                  |
| autoconf      | 2.69-3         | ibm              |
| automake      | 1.15-3         | ibm              |
| libutil-devel | 0.9.1-1        | ibm              |
| libutil2      | 0.9.1-1        | ibm              |
| nodejs12      | 12.18.4-1      | ibm              |
| php-bcmath    | 7.4.11-3seiden | seiden_stable_74 |
| php-bz2       | 7.4.11-3seiden | seiden_stable_74 |
| php-calendar  | 7.4.11-3seiden | seiden_stable_74 |
| php-cli       | 7.4.11-3seiden | seiden_stable_74 |
| php-common    | 7.4.11-3seiden | seiden_stable_74 |
| php-ctype     | 7.4.11-3seiden | seiden_stable_74 |
| php-curl      | 7.4.11-3seiden | seiden_stable_74 |
| php-devel     | 7.4.11-3seiden | seiden_stable_74 |
| php-exif      | 7.4.11-3seiden | seiden_stable_74 |
| php-fileinfo  | 7.4.11-3seiden | seiden_stable_74 |
| php-fpm       | 7.4.11-3seiden | seiden_stable_74 |
| php-ftp       | 7.4.11-3seiden | seiden_stable_74 |
| php-gd        | 7.4.11-3seiden | seiden_stable_74 |
| php-gettext   | 7.4.11-3seiden | seiden_stable_74 |
| php-ibm_db2   | 2.0.8-26seiden | seiden_stable_74 |
| php-iconv     | 7.4.11-3seiden | seiden_stable_74 |
| php-mbstring  | 7.4.11-3seiden | seiden_stable_74 |
| php-mysqlnd   | 7.4.11-3seiden | seiden_stable_74 |
| php-odbc      | 7.4.11-3seiden | seiden_stable_74 |
| php-opcache   | 7.4.11-3seiden | seiden_stable_74 |
| php-openssl   | 7.4.11-3seiden | seiden_stable_74 |
| php-pdo       | 7.4.11-3seiden | seiden_stable_74 |
| php-phar      | 7.4.11-3seiden | seiden_stable_74 |
| php-process   | 7.4.11-3seiden | seiden_stable_74 |
| php-soap      | 7.4.11-3seiden | seiden_stable_74 |
| php-sockets   | 7.4.11-3seiden | seiden_stable_74 |
| php-sodium    | 7.4.11-3seiden | seiden_stable_74 |
| php-tokenizer | 7.4.11-3seiden | seiden_stable_74 |

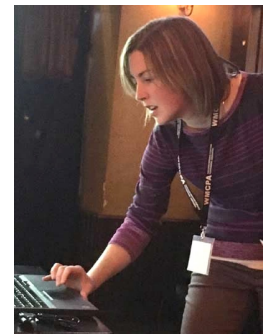


# About Seiden Group (the commercial)



# Modernization using open source on the IBM i platform

- Develop with and support Node.js / Python / PHP with RPG/DB2
- APIs, Git, more
- CommunityPlus+ PHP



# CommunityPlus+ PHP



- ◆ License-free PHP with optional paid support
  - ◆ Compatible with Zend Framework, Laminas, Laravel, Slim...
- ◆ Verified for use with:



START YOUR DASHBOARD



- ◆ **Free migration assessment with Alan:**
  - ◆ <https://www.seidengroup.com/free-php-upgrade-assessment/>



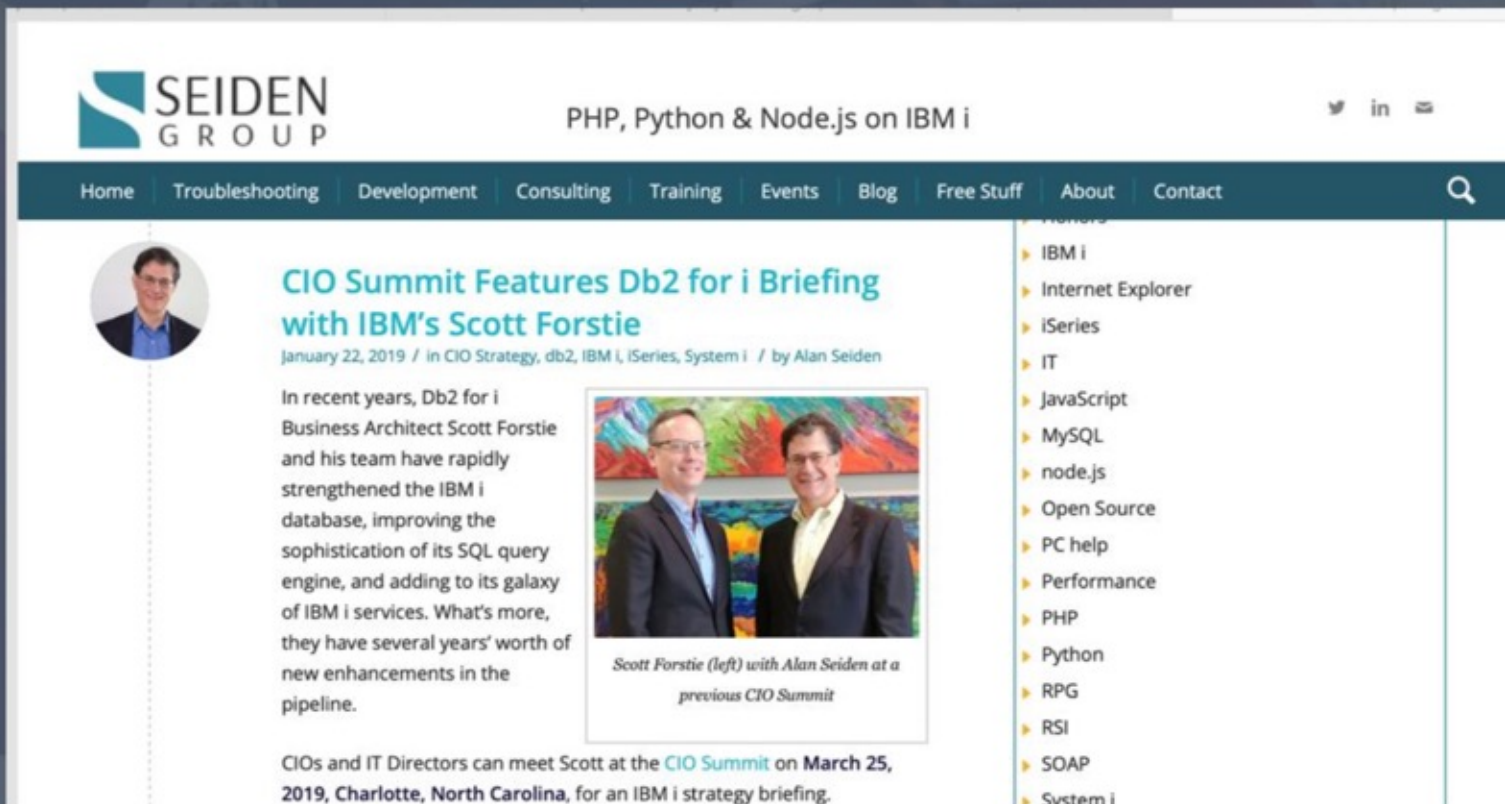
# Professional CommunityPlus+ Support

- ◆ Trusted setup and support by Seiden Group
  - ◆ <https://www.seidengroup.com/php-ibm-i-production-support/>
- ◆ Installation service via screen share for \$995 USD
  - ◆ Learn alongside Seiden Group PHP experts
- ◆ Upgrade to PHP 7.x or 8.x, migration and testing services
- ◆ CommunityPlus+ Business
  - ◆ Developer Productivity Package
  - ◆ Proactive Tune-Ups
  - ◆ Production break/fix support (up to 24x7)
    - ◆ Full-stack help with PHP, Apache, Db2 connectivity, MariaDb, Toolkit
  - ◆ Framework upgrade consulting



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## CIO Summit Features Db2 for i Briefing with IBM's Scott Forstie

January 22, 2019 / in CIO Strategy, db2, IBM i, iSeries, System i / by Alan Seiden

In recent years, Db2 for i Business Architect Scott Forstie and his team have rapidly strengthened the IBM i database, improving the sophistication of its SQL query engine, and adding to its galaxy of IBM i services. What's more, they have several years' worth of new enhancements in the pipeline.



Scott Forstie (left) with Alan Seiden at a previous CIO Summit

CIOs and IT Directors can meet Scott at the [CIO Summit](#) on **March 25, 2019, Charlotte, North Carolina**, for an IBM i strategy briefing.

- IBM i
- Internet Explorer
- iSeries
- IT
- JavaScript
- MySQL
- node.js
- Open Source
- PC help
- Performance
- PHP
- Python
- RPG
- RSI
- SOAP
- System i

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