

Troubleshooting Cerner Ignite APIs for Millennium

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Set-up

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Setup



- [http://bit.ly/chc learning lab](http://bit.ly/chc_learning_lab)
- Select “Troubleshooting”
- Need to download Postman or use your favorite REST Client

Dos and Don'ts

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Do

- Do try to recreate (in sandbox)
- Do note the X-Request-Id (correlation id) header in the response
- Do note the error message in the response
- Do double-check the documentation
- Do use debugging tools, if available

Don't

- Do NOT compromise PHI/PII
- Do NOT compromise secrets
- Don't ignore errors
- Don't assume it was a fluke

References

HTTP Spec

<https://www.w3.org/Protocols/rfc2616/rfc2616-sec10.html>

10.2.1 200 OK

The request has succeeded. The information returned with the response is dependent on the method:
GET an entity corresponding to the requested resource is sent in the response;
HEAD the entity-header fields corresponding to the requested resource are sent in the response;
POST an entity describing or containing the result of the action;
TRACE an entity containing the request message as received by the end server.

10.2.2 201 Created

The request has been fulfilled and resulted in a new resource being created. The newly created resource is given by a Location header field. The response SHOULD include an entity containing a list of resources if that format is specified by the media type given in the Content-Type header field. The origin server] SHOULD respond with 202 (Accepted) response instead.

A 201 response MAY contain an ETag response header field indicating the current value of the resource.

10.2.3 202 Accepted

Beyond HTTP Spec

https://en.wikipedia.org/wiki/List_of_HTTP_status_codes

418 I'm a teapot ([RFC 2324](#))

This code was defined in 1998 as one of the traditional [IETF April Fools' jokes](#), in [RFC 2324](#), *Hyper Text Coffee Pot Control Protocol*. The RFC specifies this code should be returned by teapots requested to brew coffee.^[50] This HTTP status is used as an [Entity tag](#).

421 Misdirected Request ([RFC 7540](#))

The request was directed at a server that is not able to produce a response.^[52] (for example because of a connection reuse)^[53]

422 Unprocessable Entity ([WebDAV](#); [RFC 4918](#))

The request was well-formed but was unable to be followed due to semantic errors.^[16]

423 Locked ([WebDAV](#); [RFC 4918](#))

The resource that is being accessed is locked.^[16]

424 Failed Dependency ([WebDAV](#); [RFC 4918](#))

The request failed due to failure of a previous request (e.g., a PROPPATCH).^[16]

426 Upgrade Required

The client must upgrade to a higher version of the protocol.^[51]

HL7 FHIR Spec

<https://hl7.org/fhir/r4/http.html#summary>

Interaction	Response				
	Content-Type	Body	Location	Versioning	Status Codes
read	R	R: Resource	N/A	R: ETag , Last-Modified	200 , 404 , 410
vread	R	R: Resource	N/A	R: ETag , Last-Modified	200 , 404
update	R if body	O: Resource (Prefer)	N/A	R: ETag , Last-Modified	200 , 201 , 400 , 404 , 405 , 409 , 412 , 422
patch	R if body	O: Resource (Prefer)	N/A	R: ETag , Last-Modified	200 , 201 , 400 , 404 , 405 , 409 , 412 , 422
delete	R if body	O: OperationOutcome	N/A	N/A	200 , 202 , 204 , 404 , 405 , 409 , 412
create	R if body	O : Resource (Prefer)	R	R: ETag , Last-Modified	201 , 400 , 404 , 405 , 422
search	R	R: Bundle	N/A	N/A	200 , 401 ?
search-all	R	R: Bundle	N/A	N/A	200 , 401 ?
capabilities	R	R: CapabilityStatement	N/A	N/A	200 , 404
transaction	R	R: Bundle	N/A	N/A	200 , 400 , 404 , 405 , 409 , 412 , 422
history	R	R: Bundle	N/A	N/A	200
history-type	R	R: Bundle	N/A	N/A	200
history-all	R	R: Bundle	N/A	N/A	200
(operation)	R	R: Parameters/Resource	N/A	N/A	200

Note: this table lists the status codes described here, but other status codes are possible as described by the HTTP specification. Additional codes that are likely are server errors and various codes associated with authentication protocols. The [security page](#) notes several security related issues that may impact which codes to return.

Ignite Documentation

Client Errors

<https://fhir.cerner.com/millennium/r4/#client-errors>

Client Errors

There are seven possible types of client errors on API calls that receive request bodies:

- 1 Failing to send a required query parameter will result in a `400 Bad Request` response.

```
HTTP/1.1 400 Bad Request
```

```
no supported search parameters provided
```

- 2 Requesting the secure endpoint (non-`open`) without valid credentials will result in a `401 Unauthorized` response.

```
HTTP/1.1 401 Unauthorized
```

- 3 Requesting data from an unknown instance or an instance where the application is not authorized will result in a `403 Forbidden` response.

```
HTTP/1.1 403 Forbidden
```

```
Tenant not valid or accessible
```

Ignite Documentation (cont.)

Resource specific errors

<https://fhir.cerner.com/millennium/r4/scheduling/appointment/#errors-2>

Errors

The common [errors](#) and [OperationOutcomes](#) may be returned.

In addition, the following errors may be returned:

- Updating an Appointment resource with the incorrect version will result in a [409 Conflict](#) response.
- Updating an Appointment resource without sending the [If-Match](#) header will result in a [412 Precondition Failed](#) response.
- Updating an Appointment resource which is currently being modified will result in a [423 Locked](#) response.
- If the Appointment resource could not be updated because of an operation that is necessary for the update (eg. encounter association), [424 Failed Dependency](#) response will be returned.
- Patching a Video Visit appointment with add operations that has previously been patched for Video Visit links will result in a [409 Conflict](#) response.
- Mixing add and replace patch operations is not supported while patching a Video Visit Appointment and will result in a [422 Unprocessable Entity](#) response.
- Patching a Video Visit appointment with any missing required patch operations will result in a [422 Unprocessable Entity](#) response.

Exercise 1

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Question:

What error results when an Allergy Intolerance is created with a modifier extension?

Answer:

422 Unprocessable Entity with an Operation Outcome

<https://fhir.cerner.com/millennium/r4/#operation-outcomes>

Connection Issues

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Firewalls

- Especially during initial install at site
- Can be to your application
- Can be to OAuth, SMART, or FHIR

Narrowing it Down

- Load a URL in the browser
 - For FHIR, the metadata endpoint can be used
- ping
 - Can it connect?
 - Is it only me?

```
PING fhir-ehr.devcerner.com (10.162.143.6): 56 data bytes
Request timeout for icmp_seq 0
Request timeout for icmp_seq 1
Request timeout for icmp_seq 2
^C
```

Certificates

- These can look like connection issues
- Most important: know how to debug your stack
 - Know how to add trust
- <https://www.ssllabs.com/ssltest/>
- openssl
 - openssl s_client -showcerts -connect google.com:443

Google is Your Friend

SUN | Monday, November 16, 2015

Installing Trusted Certificates in a Java Keystore

By John Ruiz



By: James Connors | Principal Solutions Consultant

As software environments continue to ratchet up standards for digital certificates in more than a superficial manner, platforms are not only mandating the extent of self-signed variety and instead of trusted authority. When managing certificates in the Java environment, one tool to encounter is [keytool](#), an integral part of the Java Development Kit (JDK).

Internet Explorer comes with some security features that check for the legitimacy of a website so you can safely share sensitive data with trusted online sources. This is useful for activities like online shopping, and it is the browser's job to make sure that it safely transmits the data to the trusted site so others won't see it. These websites use digitally signed certificates so the browser can read them and declare these sites as safe. However, other websites may use third party Certification Authorities to identify themselves as safe sites. Internet Explorer may block these third party certificates, which automatically renders the site inaccessible. You can change this behavior in

Client Errors

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400 – Bad Request

- **Syntax was wrong**
 - Invalid Parameters
 - Missing Fields

401 - Unauthorized and 403 - Forbidden

- Authorization and Authentication
- 401 - You need to authenticate
- 403 - This isn't allowed
 - or.... 404?
- Additional information usually found in the “WWW-Authenticate” response header

404 - Not Found

- Check your URL!
- Not supported
- Accessing data without permissions

406 - Unacceptable

- **Accept header**
- **application/json or application/json+fhir**
- **_format parameter**

409 - Conflict & 412 - Precondition Failed

- Update or Patch
- 412 - Incorrect/No “If-Match” header provided
- 409 - Updating the wrong (outdated) version

422 – Unprocessable Entity

- **JSON was fine - something else wasn't**
- **Most common when a value can't be interpreted**
 - Mappings!

Exercise 2

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Question:

What kind of error occurs when you request this server's metadata?

Method: GET

URL: https://fhir-open.devcerner.com/r4/fb8067d7-e012-4703-8888-17b86d11f0f8/metadata?_format=json

Headers: None

Answer:

Connectivity/Firewall

Could not get any response

There was an error connecting to https://fhir-open.devcerner.com/dstu2/fb8067d7-e012-4703-8888-17b86d11f0f8/metadata?_format=json.

Why this might have happened:

- **The server couldn't send a response:** Ensure that the backend is working properly
- **Self-signed SSL certificates are being blocked:** Fix this by turning off 'SSL certificate verification' in *Settings > General*
- **Proxy configured incorrectly** Ensure that proxy is configured correctly in *Settings > Proxy*
- **Request timeout:** Change request timeout in *Settings > General*

```
PING fhir-ehr.devcerner.com (10.162.143.6): 56 data bytes
Request timeout for icmp_seq 0
Request timeout for icmp_seq 1
Request timeout for icmp_seq 2
^C
```

Exercise 3

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Question:

What's wrong?

Method: GET

URL: <https://fhir-open.cerner.com/r4/ec2458f2-1e24-41c8-b71b-0e701af7583d/Patient/12743189>

Headers: None

Answer:

406 - Not Acceptable

```
{  
  "resourceType": "OperationOutcome",  
  "issue": [  
    {  
      "severity": "error",  
      "code": "invalid",  
      "diagnostics": "The Accept Header is invalid. See the documentation on the fhir.cerner.com website for acceptable format values for the resource you are attempting to access.",  
      "expression": [  
        "http.Accept"  
      ]  
    }  
  ]  
}
```

Fix It:

URL: <https://fhir-open.cerner.com/r4/ec2458f2-1e24-41c8-b71b-0e701af7583d/Patient/12743189?format=json>

Headers: None

OR

URL: <https://fhir-open.cerner.com/r4/ec2458f2-1e24-41c8-b71b-0e701af7583d/Patient/12743189>

Headers:

- Accept: application/fhir+json

Exercise 4

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Question:

What's wrong?

Method: GET

URL: <https://fhir-open.cerner.com/r4/ec2458f2-1e24-41c8-b71b-0e701af7583d/MedicationRequest?status=active>

Headers:

- Accept: application/fhir+json

Answer:

400 - Bad Request

```
{  
    "resourceType": "OperationOutcome",  
    "issue": [  
        {  
            "severity": "error",  
            "code": "invalid",  
            "details": {  
                "text": "at least one of _id and patient must be provided"  
            }  
        }  
    ]  
}
```

<https://fhir.cerner.com/millennium/r4/medications/medication-request/#parameters>

Fix It:

URL: <https://fhir-open.cerner.com/r4/ec2458f2-1e24-41c8-b71b-0e701af7583d/MedicationRequest?patient=12742400&status=active>

Headers:

- Accept: application/fhir+json

Exercise 5

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Exercise 5: Question

What's wrong?

Method: GET

URL: <https://fhirehr-code.cerner.com/r4/ec2458f2-1e24-41c8-b71b-0e701af7583d/Encounter?patient=12724066>

Headers:

- Accept: application/fhir+json

Excercise 5: Answer

401 - Unauthorized

```
{  
    "resourceType": "OperationOutcome",  
    "issue": [  
        {  
            "severity": "error",  
            "code": "login",  
            "diagnostics": "Bearer realm=\"fhirehr.cerner.com\"",  
            "expression": [  
                "http.Authorization"  
            ]  
        }  
    ]  
}
```

Exercise 5: Fix It

URL: <https://fhir-ehr.cerner.com/r4/ec2458f2-1e24-41c8-b71b-0e701af7583d/Encounter?patient=12724066>

Headers:

- Accept: application/json+fhir
- Authorization: Bearer ...

Exercise 6

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Exercise 6: Question

What's wrong?

Method: POST

URL: <https://fhir-open.cerner.com/r4/ec2458f2-1e24-41c8-b71b-0e701af7583d/Patient>

Body: <https://fhir.cerner.com/millennium/r4/individuals/patient/#example-2>

Headers:

- Accept: application/json+fhir
- Content-Type: application/json+fhir

Exercise 6: Answer

404 - Not Found

Body Cookies Headers (13) Test Results Status: 404 Not Found

Pretty Raw Preview Visualize JSON 

```
1 {  
2   "resourceType": "OperationOutcome",  
3   "issue": [  
4     {  
5       "severity": "error",  
6       "code": "not-found",  
7       "details": {  
8         "text": "Not Found"  
9       }  
10      }  
11    ]  
12 }
```

Wait, what?

Server Errors

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5xx

- **500 Internal Server Error**
- **503 Service Unavailable**
- **Correlation or X-Request-Id!!**

Asking For Help

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Google Group

- Google Group
- <https://groups.google.com/forum/#!forum/cerner-fhir-developers>

Welcome to the Cerner FHIR Developers!

This group is here to support and answer questions about the Cerner implementations of SMART and FHIR.

First, a few rules...

- **Do NOT post your OAuth Bearer token or other security credentials on this group.**
- **Do NOT post any patient data (FHIR request bodies or response bodies), outside of our open sandbox value from our server response.**
- **Do NOT post URLs that are not part of our public sandbox to this group. We can get context from them.**
- **Do NOT post recruiting requests, job seeking requests, or advertisements.**

All the guidelines above are here to protect security and sensitive patient data. It's best to get in the habit of protecting this information. If you have specific questions about what data is specific to this group, they would apply to all data your application will have access to, other public groups, and other applications.

How to ask a Question

In order to enable us to help everyone, we ask that you follow these guidelines when asking a question here:

1. **RIGHT PLACE?** Make sure the question belongs in this group.
 - For more general questions about FHIR, you may want to contact the FHIR groups documented in the [FHIR Documentation](#).
 - For more general questions about SMART, see the SMART on FHIR group here: <https://groups.google.com/forum/#!forum/smart-on-fhir>
 - **We do NOT comment on future timelines in this group.**
2. **SEARCH.** Has the question already been answered?
 - Make sure to search the existing posts to see if someone else already asked this question, and if it has been answered.
 - Please read our documentation at <http://fhir.cerner.com/> to see if the documentation answers your question. The parameters we support are documented, along with [FAQs](#), [SMART](#), and [Authorization](#) documentation.
3. **TAG.** Make sure to select the tag that best applies to your question or discussion.
4. **INVESTIGATE and DOCUMENT.** For Troubleshooting requests: provide a summary of any investigation steps taken and any documentation checked?
 - Link to any documentation you're referencing.
 - Link to your application in the code console, if applicable.
5. **EXAMPLE.** For Troubleshooting requests: Provide a simple example that recreates the issue.
 - **Ensure the simple example is in our public sandbox, not from a client site.**
 - If you have the example of an actual failure, provide the X-Request-Id (please do not provide real patient data).

Log a Service Record

- Found a possible issue?
- In eService:
 - <https://eservice.ucern.com/>
 - For Solution Family, select “Open Development Services”
 - For Solution, select “Cerner Ignite APIs for Millennium”

Exercise 7

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Exercise 7: Question

What's wrong?

Method: Browser

URL: `https://authorization.cerner.com/tenants/ec2458f2-1e24-41c8-b71b-0e701af7583d/protocols/oauth2/profiles/smart-v1/personas/provider/authorize?client_id=c4093c13-1ed1-47ef-95a6-a225d3e47023&response_type=code&redirect_uri=http://localhost:8080/foo`

Exercise 7: Answer

Authorization error



Error

"Authorization Demo App" was attempting to request access to healthcare data with Abilities Center; unfortunately, the application doesn't appear to be compatible. If you require further assistance, please contact support.

Information to provide to Technical Support

Correlation ID: 83c70c4a-7a6b-4efd-93cf-dbe0ec7bc25e

Information to provide to Authorization Demo App

The requested redirect URI does not match the one registered for "Authorization Demo App".

Error Code: urn:cerner:error:authorization
server:oauth2:grant:invalid-redirect-uri

Cerner's [developer portal](#) may provide useful information to assist in resolving this issue.

The Errors That Weren't

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No Data

- Scenario: 200 response, but no data!
- Causes:
 - No access?
 - No data?
 - No data that matches filters?
 - Data that's not mapped...

Missing Data

- Scenario: 200 Response, but I don't see everything I expect!
- Causes:
 - User permissions
 - Security
 - Some data not mapped
 - Filtered for patient access

Bad Data

- **Scenario:**
 - Data is returned, but no codes
 - Data is returned, but some fields are empty
 - Data is returned, but not as expected
- **Cause:**
 - Most common: data is not mapped
 - Sanity check: ensure you see the data in Millennium (within Powerchart for example)

SMART Troubleshooting

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Agenda

- Launch Points - Configuration
- Debugging SMART Apps in Powerchart
- TLS Issues
- Session Storage Concerns
- Debugging SMART Apps in MPages
 - SMART App loading cycle logs
 - SMART App console logs
- Domain Refresh Concerns
- Millennium Login Screen
- Support/Resources

App Launch Points - Configuration

- **Chart View**

- <url>[https://smart.cerner.com/smart/apps/xxxxx?PAT_PersonId=\\$PAT_PersonId\\$&VIS_EncntrId=\\$VIS_EncntrId\\$&USR_PersonId=\\$USR_PersonId\\$&PAT_PPRCode=\\$PAT_PPRCode\\$](https://smart.cerner.com/smart/apps/xxxxx?PAT_PersonId=$PAT_PersonId$&VIS_EncntrId=$VIS_EncntrId$&USR_PersonId=$USR_PersonId$&PAT_PPRCode=$PAT_PPRCode$)

- **MPage Summary/Workflow**

- [https://smart.cerner.com/smart/{tenant_key}/apps/\[xxxxx\]?PAT_PersonId={person_id}&VIS_EncntrId={encntr_id}&PAT_PPRCode={ppr_cd}&USR_PersonId={provider_id}&username={username}](https://smart.cerner.com/smart/{tenant_key}/apps/[xxxxx]?PAT_PersonId={person_id}&VIS_EncntrId={encntr_id}&PAT_PPRCode={ppr_cd}&USR_PersonId={provider_id}&username={username})

- **Organizer View**

- <url>[https://smart.cerner.com/smart/apps/xxxxx?USR_PersonId=\\$USR_PersonId\\$](https://smart.cerner.com/smart/apps/xxxxx?USR_PersonId=$USR_PersonId$)

Ref:

- <https://wiki.cerner.com/display/public/reference/Configure+SMART+Applications+to+Run+in+PowerChart>
- <https://wiki.cerner.com/display/reference/Configure+the+Workflow+SMART+Component>

App Debugging in Powerchart

The screenshot shows the Cerner Powerchart interface with the title bar "SMART, JOE - 10002702 Opened by Sarkar, Shriniket". The menu bar includes Task, Edit, View, Patient, Chart, Links, Notifications, Navigation, Help, and various system icons. The main window displays patient information for "SMART, JOE" (PCP: McCurdy, Michael, Phone: (913) 989-8765, Age: 43 years) and clinical details (DOB: 4/29/1976, Wt: Error, Sex: Male, Pref. Labs/Diagnostics: Error, MRN: 10002702, Inpatient FIN: 20003700 [Admit Dt: <No - Inpatient admit date>] Loc: Baseline East, Baseline East). A sidebar on the left lists various applications like Careview, Kol Sample App, Tutorial MPage Test, Health Tensor, Clinical Notes, Orders, Test - burn, test Diabetes dashboard, Support KT App, Clinical Notes, Health Maintenance, Watson Access UI, Watson Window, Sample ASCVD Modb, DCOS - SAV DSTU2, DCOS - Growth Chart DSTU2, DCOS - Cardiac Risk DSTU2, DCOS-LATEST-SAV DSTU2, DCOS-LATEST-GrowthChartDSTU2, DCOS-LATEST-CardiacRiskDSTU2, O, Siemens IDS App, Orion Browser, CardiacRisk App_NN, NNSMARTWORKFLOW, and SmartAppValidator-FTwelve (selected). The main content area shows the "SmartAppValidator-FTwelve" application with sections for "Browser Info" (listing browser and user agent details), "Health Checks" (listing success for SMART App Service, Authorization, and FHIR Service), and a "Resources" section with a "Console" tab displaying log messages. The log shows entries like "14:46:22.547 Logging this message for f-twelve demo." and "14:46:22.548 SMART Object: { "server": { "serviceUrl": "https://fhir-ehr.sandboxcerner.com/dstu2/0b8a0111-e8e6-4c26-a91c-5069cbc6b1ca", "auth": { "type": "bearer", "token": "eyJraWQiOiIyMDE5LTa2LTEzVDIyOjQ2OjI1LjYxOS51YyIsInR..."} }". The status bar at the bottom right indicates "FHIRPLAY SS025783 June 14, 2019 2:47 PM CDT".

Ref : <https://engineering.cerner.com/f-twelve/>

Ref : [Modern.IE](#)

TLS 1.0, TLS 1.1, and TLS 1.2

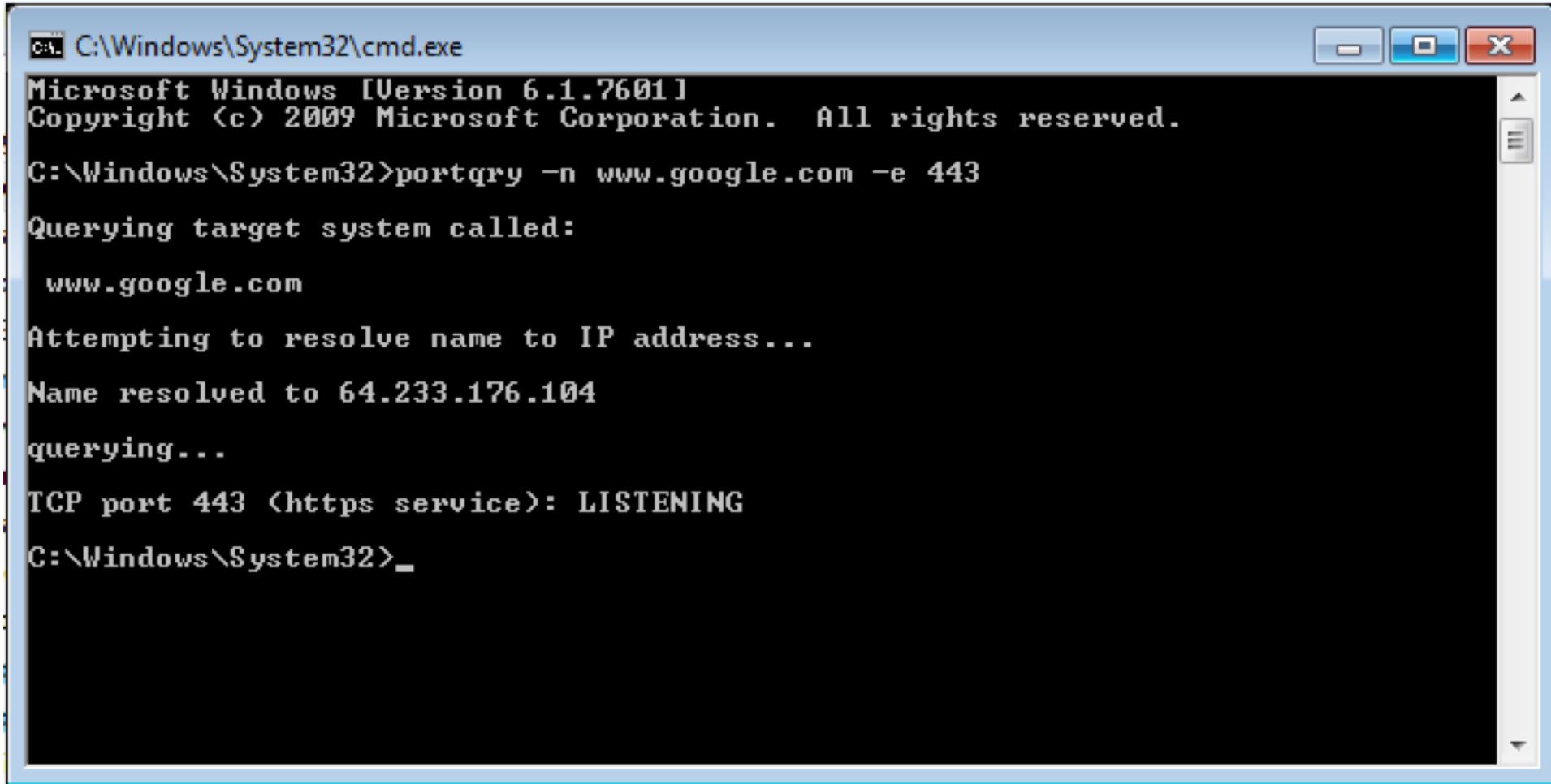
Error Message in Powerchart:

This page can't be displayed.

Turn on TLS 1.0, TLS 1.1, and TLS 1.2 in Advanced settings and try connecting to <https://xyz.yourapplication.com> again. If this error persists, it is possible that this site uses an unsupported protocol or cipher suite such as RC4 (link for details), which is not considered secure. Please contact your site administrator.

TLS 1.0, TLS 1.1, and TLS 1.2

Run a port query:



```
C:\Windows\System32\cmd.exe
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Windows\System32>portqry -n www.google.com -e 443
Querying target system called:
www.google.com
Attempting to resolve name to IP address...
Name resolved to 64.233.176.104
querying...
TCP port 443 (https service): LISTENING
C:\Windows\System32>
```

Session Storage - IE Powerchart

Issue:

- Limitation - Embedded IE browser
 - Does not partition off sessionStorage available to apps per tab (depends on *Cerner Millennium Powerchart* release)
- FhirClient.js : <https://github.com/cerner/fhir-client-cerner-additions>

Session Storage - IE Powerchart

Recommendation:

- Use a Unique Identifier to partition off the storage for your app
 - You can use a UUID OR
 - You can use the state parameter available to your app after authorization
 - Avoid Session bleed : <https://github.com/cerner/fhir-client-cerner-additions>
- Flex apps implementation based on embedded vs stand-alone mode
- Avoid using sessionStorage

Ref: <https://fhir.cerner.com/smart/#embedded-browser-control>

SMART Apps in MPages

Possible Issues:

- URL Configuration Issues
- Configured URL updates do not show up in Powerchart
- Blank Screen - App does not load in an MPage
- Height Scaling - App loads without taking its full height on the screen
- iFrame Cookies Issue - P3P
- Other MPages considerations

Configuration URL Issue - Bedrock

- **Correct URL:**

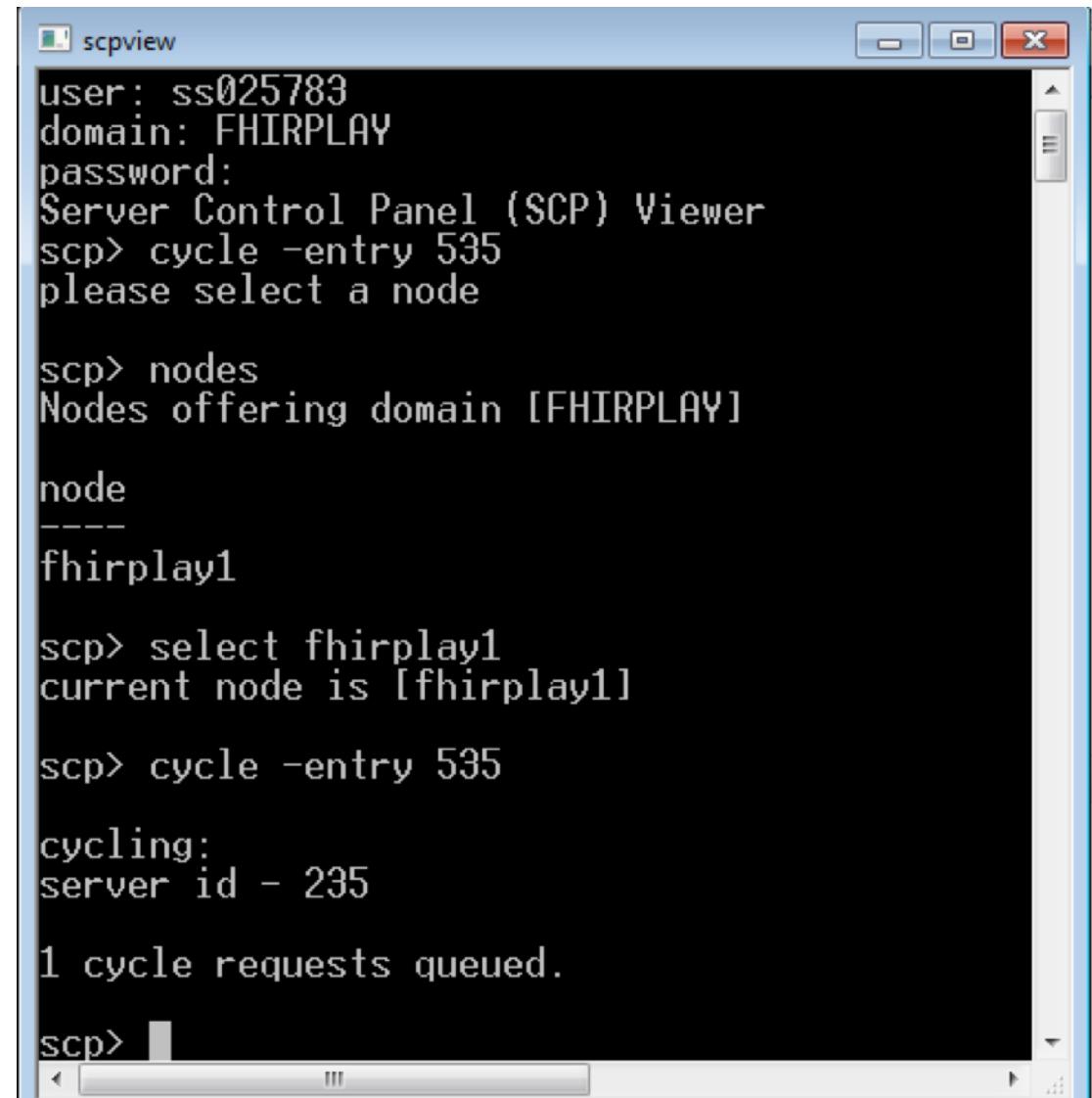
`https://smart.cerner.com/smart/{tenant_key}/apps/[SMART_APP_ID]?PAT_PersonId={person_id}&PAT_PPRCode={ppr_cd}&USR_PersonId={provider_id}&username={username}`

- **Incorrect URL:**

`https://smart.cerner.com/smart/0b8a0111-e8e6-4c26-a91c-5069cbc6b1ca/apps/[SMART_APP_ID]?PAT_PersonId={person_id}&PAT_PPRCode={ppr_cd}&USR_PersonId={provider_id}&username={username}`

Configuration Updates Not Visible in Powerchart

- SCPView Tool – Cycle Server
- Launch `scpview.exe`
- Commands:
 - nodes
 - select {node_name}
 - cycle -entry 535
 - cycle -query



The screenshot shows a Windows application window titled "scpview". The window contains a terminal-like interface with the following text:

```
user: ss025783
domain: FHIRPLAY
password:
Server Control Panel (SCP) Viewer
scp> cycle -entry 535
please select a node

scp> nodes
Nodes offering domain [FHIRPLAY]

node
---
fhirplay1

scp> select fhirplay1
current node is [fhirplay1]

scp> cycle -entry 535

cycling:
server id - 235

1 cycle requests queued.

scp>
```

Blackbird Logger - Debugging in MPages

The screenshot shows the SMART in MPage application interface. At the top, there's a header bar with the patient name "SMART, JOE" and various navigation links. Below the header, a sidebar on the left lists numerous clinical applications and tools. The main content area is titled "ASCVD Risk App". It features fields for "Sex" (Male selected), "Age" (42), "Race" (White, African American, Other), and "Total Cholesterol (mg/dL)" (200). A large green button labeled "See Risk Score" is prominent. To the right, a floating window displays detailed log information related to the app's execution.

SMART, JOE - 10002702 Opened by Sarker, Shriniket

Task Edit View Patient Chart Links Notifications Navigation Help

Message Center Ambulatory Organizer Staff Assignment Physician Handoff Home CareCompass Schedule Patient List Rounds List Cerner TP Silver Lion Cerner Support Census Task List Activity Assignment APACHE Cardiovascular Quality Measures MPages

New Sticky Note View Sticky Notes Tear Off Change Charges Charge Entry Exit Calculator Message Sender AdHoc Medication Administration PM Conversation Depart Communicate Patient Education Medical Record Request Create PHI Patient Pharmacy Explorer Menu Result Copy

SMART, JOE

Allergies: Error

IQHealth: Yes

Menu

SMART Sensotrend Diabetes Diary

BG App Validator DSTU2

BG App Validator May2015

BG Cardiac Risk App May2015

BG Cardiac Risk App DSTU2

BG Growth Chart May2015

BG Growth Chart DSTU2

CDS Hooks Demo

Chart Summary Screen

HealthInsights staging - soumya

Care Coordination - Problem/Goal...

Test EB

FHIRPLAY App Validator DSTU2

EasyScript

AKI (DuoDecim)

Clinical Notes + Add

Health Concerns

Bear Institute - Diabetes Management

JPA Skåne App

ACM

SMART in MPage

Workflow mPages

SMART in MPages - BG

Google

SMARTTESTWORKFLOW

Form Browser

MPages COM Test

SS_SMARTinMPage

UTD Launch Pathway

SMART CPW

EvolveDev

Bear Institute - Burn App

SMART Careive

Careive

Kol Sample App

Tutorial MPage Test

Health Tensor

Clinical Notes + Add

Orders + Add

Test - burn

test Diabetes dashboard

PCP-McCurdy, Michael
Phone:(913) 989-8765
Age:42 years

DOB:4/29/1976
Vt:Error
Sex:Male

Pref. Labs/Diagnostics:Error
MRN:10002702
Inpatient FIN: 20003700 [Admit DT: <No - Inpatient admit date>] Loc: Baseline East, Baseline East

Full screen Print 0 minutes

SMART in MPage

MPages View

ASCVD Risk App

ASCVD Risk App

Sex

Male Female

Age

42

* Race

White

African American

Other

Total Cholesterol (mg/dL)

200

* HDL - Cholesterol (mg/dL)

20-100

Systolic Blood Pressure (mm Hg)

110

See Risk Score

* The following are required:
Cholesterol (mg/dL), Race

[Log Information]

```
dyMFpIaFrR2JwZmZ6LUkydnQ5UFZMOFVpbmZoZE9EbFpIQmQ3R1hKNnk4QUpdbHhY1dEMvpKTK5KNTNLX091dkdqUHzhSHBFZDhfyWxEd1Z1V0%3D%3D&correlation_id=ffff77350-cbbb-11e8-aa61-91c4a35b83d5&relationshipId=1115
```

[Log Information]

```
[ASCVDRiskApp] [ContentProvider] [Authorization] [Launch URL] https://smart.sandboxcernerpowerchart.com/ascvd-risk-app/launch.html?iss=https%3A%2F%2Ffhir-ehr.sandboxcerner.com%2Fdstu2%2F0b8a0111-e8e6-4c26-a91c-5069cbc6b1ca&launch=85013374-0acc-46a1-87de-bd4a7361563&embedded-supported-version=2&tenant_key=0b8a0111-e8e6-4c26-a91c-5069cbc6b1ca&authentication=Cerner-Identity-Token+ZX1KMGVYQW1PaUpLVjFRaUxDSmhR2NpT2IKU1uWrXhYelVpTENKcmFXUw1PaUpUVGQ1YwTjFZMmx0WHPsdFtMTNTRmQ1YUR0eFuXxDxbXhpT1RoQk9FrkRjRVZCUVK05S1pZuBaUqRTFNetm3T0RjeU1EVTRNvGdzSw1semNSTzJakJpt1o01URXhV1Q0WlRZdE5HTX1oTa0T1RGakxUVX0amxqW1NM1lqRmpZU01zWS5CeWpStZJ3a3RuUWkdU1sVkJUvUzU0TdGTWNTxNbXBmZwsxNfUjwB0Q001zwsWNNDSTzJa05GWs1ZlRveGZTVJmVku5TFJVNzWakVpZ1EuZEZ1VzdPYtdoMnZGeWp1HRUbGdpUEnaVjN65Ec1STFPV3N20EhXQMp3TG1wZGx5dExQSGE1bHphYkE1S1NuJdBJdVja03stnJ6VjJTkiiqUUZRUReWdLUk5NM0xhWm1nWnRTOEs4TdkSn4Sm1NQ051NFTUUh2cVb5R1VRMByOTVNW1F5jJXbhkTwtkkeUxBeDNYXzBhWU1GckxzeWFrYmxPZGZV02V5SjBIWFpt2Lks1YxUn1M00poYkdjaU9pSLNvME4WpValUxDSnJhV1FpT21LKQ1FVRKnMWE4xWtJsdFh6bHRRbTezU0ZkNFEtNhVMF3V214aUsUaJPRUZCUVWQ1FTsJkuZX1KbGVIQW1PakUxTxprd9EY31NRFU070Rrc81tb1pjeUk2SNpCaU9HRXkdnVE4TfdNFpDUxROR015TmikxaE9URepMFV3TmpsallttTTZakZqjWNNc0lu0nliaUk2S1pneimRxcG1Tb1oyU1d4N1ZuaG1ZVVJ0v010k5XSnzjRpUy31Jc0luUjVjQ0k2SWt0R1VrNWZUVXhmU1VSZ1ZF0UxSVTvmVmpFawZRlmE50QUQyZVhmZfZcs1sekx5NjgxWfqb0M5ZDRfb2LqcmxFdkVkc283M0dhaU1cW9mN3Vq0lFybXJGdjg2WjfjQ3FaWjM0ZVxat11SYjdEc01TcnB5eEddyMFpIaFrR2JwZmZ6LUkydnQ5UFZMOFVpbmZoZE9EbFpIQmQ3R1hKNnk4QUpdbHhY1dEMvpKTK5KNTNLX091dkdqUHzhSHBFZDhfyWxEd1Z1V0%3D%3D&correlation_id=ffff77350-cbbb-11e8-aa61-91c4a35b83d5&relationshipId=1115
```

FHIRPLAY SS025783 October 09, 2018 7:09 AM CDT

Blackbird Logger - Debugging in MPages

- Key Combinations:

- Mac: Command + \
- Windows: Control + \
- Relocate Window: Shift + F2

- Refresh the MPages component to see the Blackbird window

The screenshot shows the Blackbird Logger application window. At the top, there is a toolbar with various icons: a green checkmark, a blue info icon, a yellow minus icon, a red exclamation mark, a magnifying glass, and a refresh symbol. Below the toolbar is a list of log entries. One entry is highlighted in red, indicating it is the current focus. This entry is titled "Firing Shared Resource Event" and contains the following details:
Resource Name: embeddedDataURL
Resource Data: {"REPLY": {"EMBEDDED_BASE_URL": "https://embedded.sandboxcerner.com/embedded/content", "STATUS_DATA": {"STATUS": "S", "SUBEVENTSTATUS": [{"OPERATIONNAME": "", "OPERATIONSTATUS": "", "TARGETOBJECTNAME": "", "TARGETOBJECTVALUE": ""}]}}}
The rest of the list contains other log entries, such as "Rendering View Builder MPages View" and "Request Name: Shared Resources Data Retrieval Program Name: CP_EMBEDDED_URL Parameter Array: ^MINE^ Data Blob: null readyState: 4 status: 200 Response: {"REPLY": {"EMBEDDED_BASE_URL": "https://embedded.sandboxcerner.com/embedded/content", "STATUS_DATA": {"STATUS": "S", "SUBEVENTSTATUS": [{"OPERATIONNAME": "", "OPERATIONSTATUS": "", "TARGETOBJECTNAME": "", "TARGETOBJECTVALUE": ""}]}}}}".
On the right side of the window, there is a sidebar with sections labeled "Care Gaps Addressed" and "HCC Suggestions". The "Care Gaps Addressed" section shows a progress bar at 77.12% completion. The "HCC Suggestions" section is partially visible.

Blackbird Logger - How to Debug

SMART App Launch URL :

- Copy the apps resolved launch URL:

 Navigating to the SMART launch URL:

<https://smart.sandboxcernerpowerchart.com/ascvd-risk-app/launch.html?iss=https%3A%2F%2Ffhir-ehr.sandboxcerner.com%2Fdstu2%2F0b8a0111-e8e6-4c26-a91c-5069cbc6b1ca&launch=85013374-0acc-46a1-87de-bd4a7361563c&embedded-supported-version=2>

- Access to Domain:

- Open the URL in Internet Explorer on the Citrix session to see if the app loads
- X-Frame-Options header

Blackbird Logger - How to Debug Embedded App URL :

- **Access to Domain:**
 - Open the URL in Internet Explorer on the Citrix session to see if the app loads
- **Height resizing issues should show up with this URL**

[i] [ASCV Risk App] Mounting Embedded Server:
[Ref : <https://github.com/cerner/cerner-smart-embeddable-lib#sizing-content>](https://embedded.sandboxcerner.com/embedded/content?embedded-supported-version=2&correlation_id=fff77350-cbbb-11e8-aa61-91c4a35b83d5&Authorization=OAuth+oauth_token%3D%22ConsumerKey%253D0b8a0111-e8e6-4c26-a91c-5069cbc6b1ca%2526Consumer.Principal%253D0000.0000.0015.0EAB%2526ExpiresOn%253D1539090505%2526HMACSecrets%253Df6cQ3rwiFyRzHd-Mclgn_dmk-6D1fGmUMKnWnpj7RiiBCCJhj9hjGLLr3psNpGLfW HUMAuk4O_N7WmZmNKeaDn7-zXKRycsHqZuInRJ4SY%25253D%2526KeysVersion%253D5aa6e82-b9e5-4b36-9d61-f633380662f3%2526RSASHA1%253DiwM06Xyt6FRCPmukj30yv-ZA2VCwZovothCa4FiRVkBzEfKkk1_8kt2GhITHzbYr34X-dUrb6pHZWMQs40aUX-YdRavjxBDR4M5UU17vb7zdq-2oiSe1wsLxjxsm2_hwYQ4piN7RCYjmigPqmYJCib3r6GZigcPOz9NePXeKObmIAYciId7drFvXliC6bi8ZZr_qJ-yG28zFI4jaSdkOoFCzoUirdhSlopEVa4JkSiVoSsmmt6kZsQCIRntDP8AKjuhmnpw1f1qp4FzG4L1QjqKrVQ1WhuRQAB8_PsGG8xSywTQh7uHIRn14T0I_CcnE9XI1pBpufisPiNFXh7zng%25253D%25253D%22%2Coauth_consumer_key%3D%220b8a0111-e8e6-4c26-a91c-5069cbc6b1ca%22%2Coauth_signature_method%3D%22PLAINTEXT%22%2Coauth_timestamp%3D%221539086895%22%2Coauth_nonce%3D%22831137%22%2Coauth_version%3D%221.0%22%2Coauth_signature%3D%222526Lcmy_exMWAZ0f9-vdPowCCL-HjvkKONu%22&url=https%3A%2F%2Fsmart.sandboxcernerpowerchart.com%2Fascvd-risk-app%2Flaunch.html%3Fiss%3Dhttps%253A%252F%252Ffhir-ehr.sandboxcerner.com%252Fdstu2%252F0b8a0111-e8e6-4c26-a91c-5069cbc6b1ca%26launch%3D85013374-0acc-46a1-87de-bd4a7361563c%26embedded-supported-version%3D2%22</p></div><div data-bbox=)

Cookies in MPages - P3P Header

- IE rejects cookies from 3rd party contexts (Default)
- Want to use cookies in your SMART App ?
 - Add P3P Header (recommended approach)
OR
 - Add Meta Tag with the same content (less common)

Ref : <https://blogs.msdn.microsoft.com/ieinternals/2013/09/17/a-quick-look-at-p3p/>

MPages - Considerations

- **HTML5-DOCTYPE** (<!DOCTYPE html>)

Ref: <https://fhir.cerner.com/smart/#html5-doctype>

- **X-UA-Compatible Tag** (<meta http-equiv="X-UA-Compatible" content="IE=edge">)

Ref: <https://fhir.cerner.com/smart/#x-ua-compatible-tag>

- **Remove X-FRAME-OPTIONS & Content-Security-Policy (CSP) frame-ancestors**

Ref: <https://github.com/cerner/cerner-smart-embeddable-lib#additional-consideration>

- **Sizing Issues**

Ref: <https://github.com/cerner/cerner-smart-embeddable-lib#sizing-content>

Domain Refresh - MPages in Non-Production

In your system's back-end node, connect to CCL and run the following command:

```
update into dm_info
```

```
set info_char = "https://embedded.sandboxcerner.com/embedded/content"
```

```
where info_domain = "ORION" and INFO_NAME = "EMBEDDED_BASE_URL"
```

```
go
```

```
commit go
```

Ref: <https://wiki.cerner.com/display/public/reference/Configure+the+Workflow+Web+Component>

Millennium Login Screen

- Whitelist Trusted sites for that endpoint to avoid this issue.

- Non-Prod :

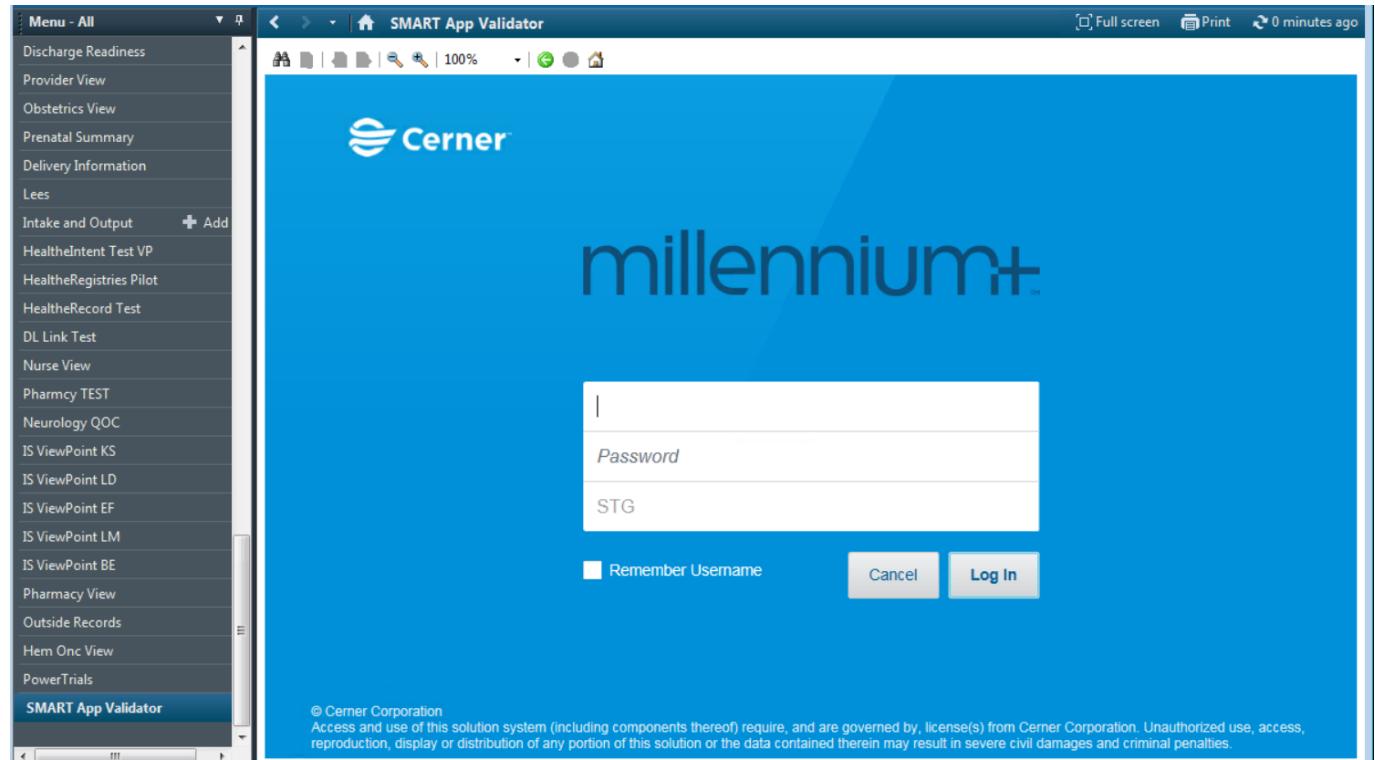
- https://*.sandboxcerner.com
- https://*.sandboxcernerpowerschart.com
- https://*.sandboxcernermillennium.com

- Prod :

- https://*.cerner.com
- https://*.cernerpowerschart.com
- https://*.cernermillennium.com

- Ref :

<https://wiki.cerner.com/pages/releaseview.action?spaceKey=reference&title=Install+cerner+ignite+APIs#InstallCernerIgniteAPIs-TechnologyRequirements>



Support/Resources

- **Support**

- Service request - Log an SR to - Cerner Ignite APIs for Millennium
- uCern - Reach out through your dedicated uCern group
- Google Group - <https://groups.google.com/forum/#!forum/cerner-fhir-developers>

- **Resources**

- Tutorial - <https://engineering.cerner.com/smart-on-fhir-tutorial/>
- Documentation: <https://fhir.cerner.com/smart>
- Smart-embeddable-library: <https://github.com/cerner/cerner-smart-embeddable-lib>

Thank You!!

- Madhur Rajendran & Fenil Desani