

Building Security into Your ArcGIS System

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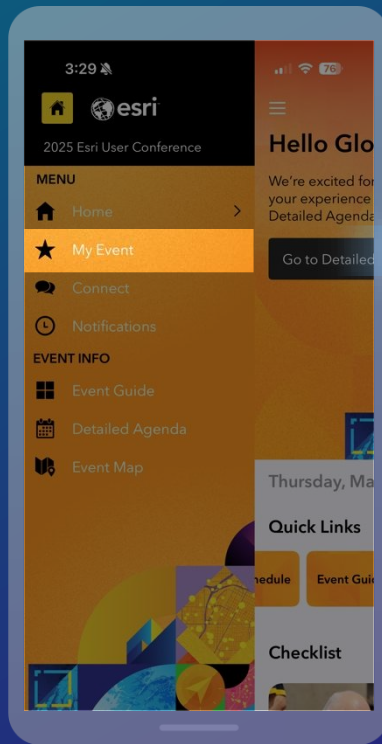
```
Map map = new Map(BasemapStyle.ArcGISNavigation);  
map.InitialViewpoint = new Viewpoint(40.72,  
-73.995,  
72000);  
mapView.Map = map;
```

```
class MainActivity : AppCompatActivity() {  
    override fun onCreate(savedInstanceState: Bundle?) {  
        super.onCreate(savedInstanceState)  
        setContentView(  
            R.layout.activity_main, SampleAppTheme {  
                ...  
            })  
        val map = ArcGISMap(BasemapStyle.ArcGISNavigation)  
        map.InitialViewpoint = Viewpoint(40.72,  
            -73.995,  
            72000.0)
```

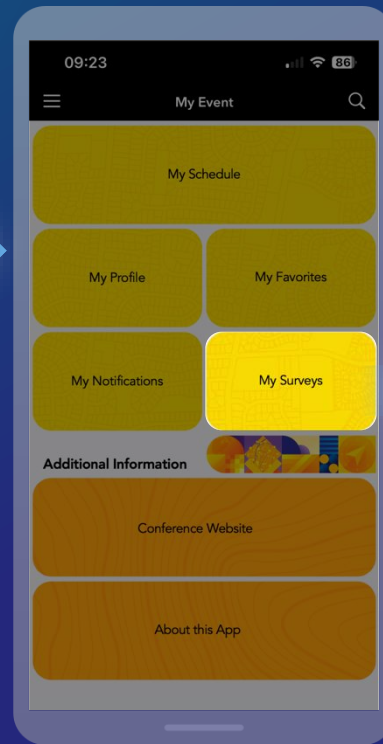
**DEV &
TECH**

Please share your feedback in the app

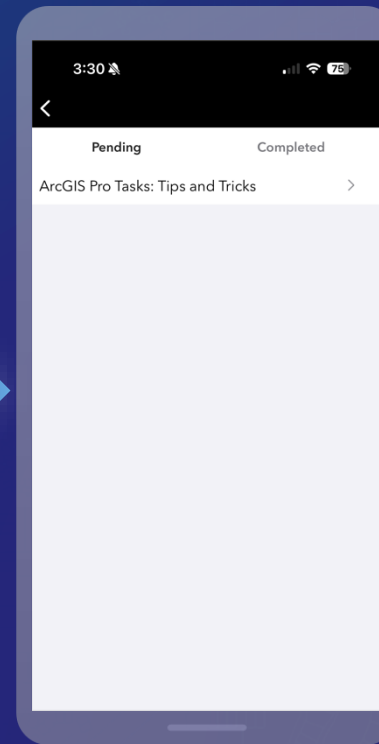
Select "My Event" in the event app main menu



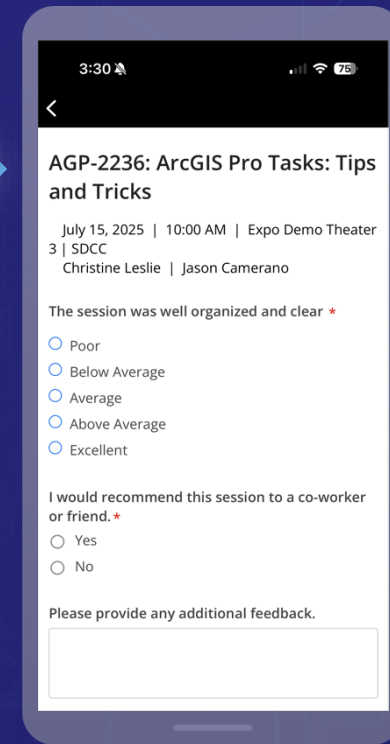
Select "My Surveys"



Select the desired survey



Complete the survey



Agenda

Guidance: [ArcGIS Hardening Guide](#), [ArcGIS Security and Privacy Adviser](#)

Demos: [Automation & Authentication](#), [Creating Certificates with Let's Encrypt/Certbot](#)

Compliance: [ArcGIS Online = FedRAMP Moderate Authorized](#), [Beyond FedRAMP](#)

Summary

Open Q&A Discussion

Guidance

Hardening Guide, Security Adviser



AN ESRI
TECHNICAL PAPER

July 2025

ArcGIS Enterprise Hardening Guide

[Click here to download latest guide from the ArcGIS Trust Center](#)

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March 2026

ArcGIS Enterprise Hardening Guide

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This document contains two security profile levels:

Basic: Controls flagged as Basic are the recommended minimum security measures for production environments. The Basic profile is appropriate for over 95 percent of our customer base security needs. This profile aligns with industry security standards from the National Institute of Standards and Technology (NIST) as well as the International Organization for Standardization (ISO), which are applicable to a broad range of regulatory compliance frameworks commonly required by customer security policies.

Advanced: Controls flagged as Advanced are appropriate for deployments where ArcGIS Enterprise is categorized as [critical software](#). Most customers should find the Basic profile appropriate for their operations; however, if your organization uses ArcGIS Enterprise for mission-critical operations or must prioritize stringent security compliance requirements over usability then the Advanced profile should be considered. The Advanced profile in this document supersedes the guidance found in the ArcGIS Server Security Technical Implementation Guide (STIG) as well as the generic DISA Application Security and Development STIG when using ArcGIS Enterprise. The Advanced profile addresses the security measures appropriate for software defined as critical by NIST, as well as appropriate STIGs, to meet the most rigorous customer security requirements around the world in a more standard, secure, and reliable manner. As stated under DISA rule [APSC-DV-002970](#), "...products not covered by a STIG, should follow...vendors lock down guides and recommendations", which for ArcGIS Enterprise is this guide.

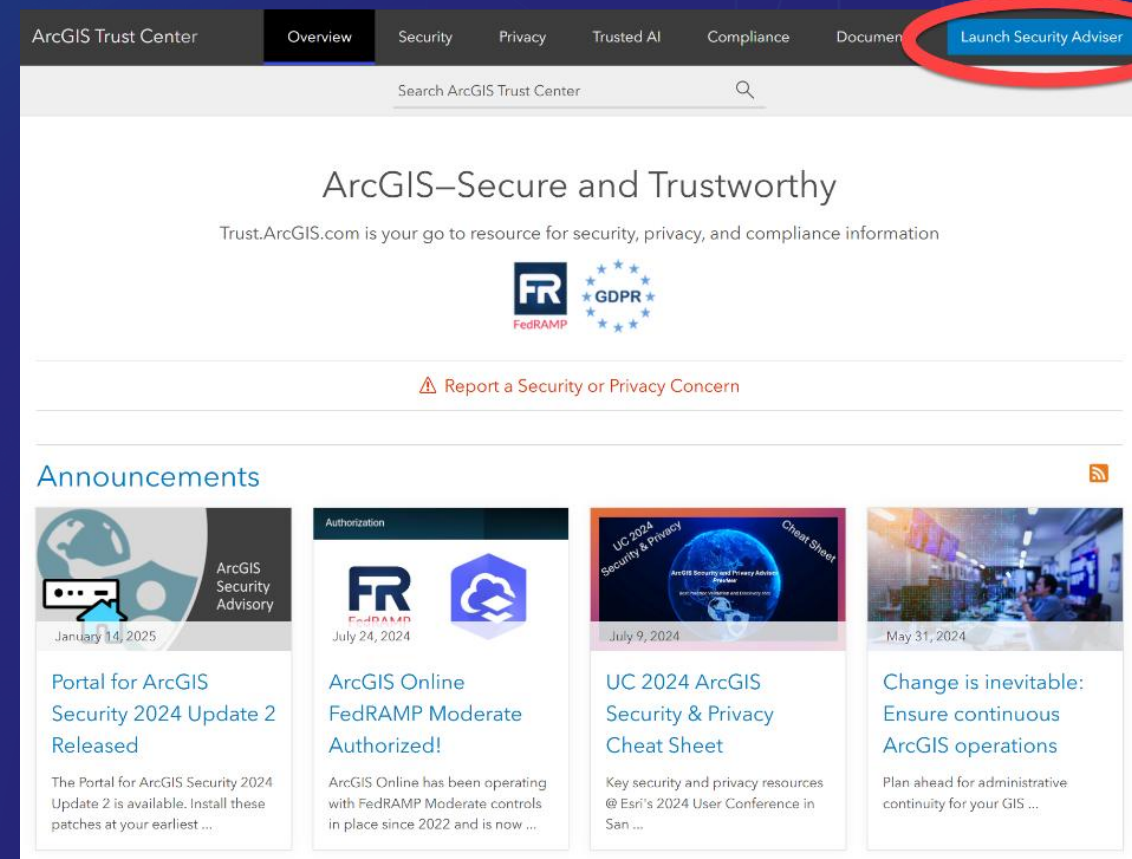


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ArcGIS Security and Privacy Adviser

Ensure systems are configured in alignment with best practices

- Where? ArcGIS Trust Center home page
- What? Scan ArcGIS Online or Enterprise
- Who? Requires Admin role
- Cost? Free
- Setup? None
- Time? Less than 1 minute

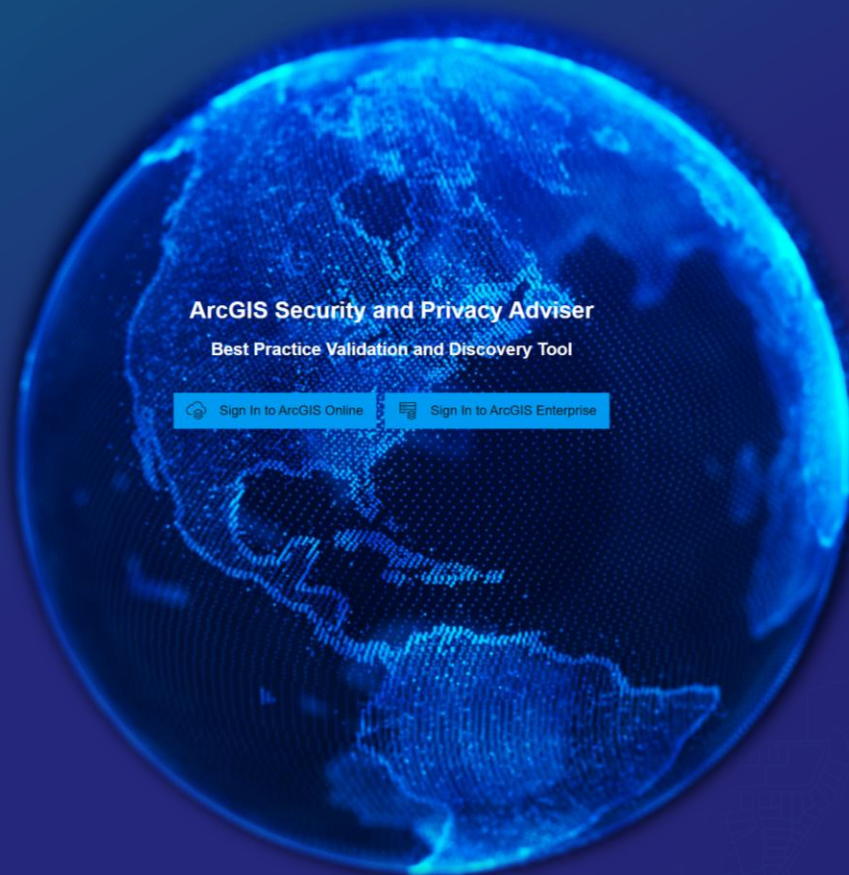


The screenshot shows the ArcGIS Trust Center website. The navigation bar includes 'ArcGIS Trust Center', 'Overview', 'Security', 'Privacy', 'Trusted AI', 'Compliance', 'Documents', and a circled 'Launch Security Adviser' button. Below the navigation bar is a search bar and the heading 'ArcGIS—Secure and Trustworthy'. The main content area features logos for FedRAMP and GDPR, a 'Report a Security or Privacy Concern' link, and an 'Announcements' section with four cards: 'ArcGIS Security Advisory' (Jan 14, 2025), 'ArcGIS Online FedRAMP Moderate Authorized!' (July 24, 2024), 'UC 2024 ArcGIS Security & Privacy Cheat Sheet' (July 9, 2024), and 'Change is inevitable: Ensure continuous ArcGIS operations' (May 31, 2024).



Using ArcGIS Security and Privacy Adviser


Launch Security Adviser





Analysis Type:


Standard





 Some issues should be reviewed


 Access and Permissions


 Sharing and Searching


 Password Policy


 Logins

 Allowed Origins


 Allowed Portal Access

 Multi-Factor Authentication

 Trusted Servers

 User Analytics

 Export CSV

 Export JSON



Address **Red** (Dangerous) items immediately

Demos

Automation & Authentication, Certificates with Let's Encrypt



Automation & Authentication

API Keys / App Auth

Create developer credentials ×

Select credential type

Developer credentials are used to get an access token for custom applications. Access tokens are required to authenticate requests to secure items and services.

API key credentials

For API key authentication

Use for public applications that do not require your users to sign in or for personal scripting apps.

[Learn more](#)

Billing	Usage billed to your ArcGIS subscription
Access token privileges	Defined as a property of the credentials item
Access token storage	Embedded in application
Access token duration	Up to one year and can be rotated

Back

Cancel

Next

Machine Authentication

API Keys



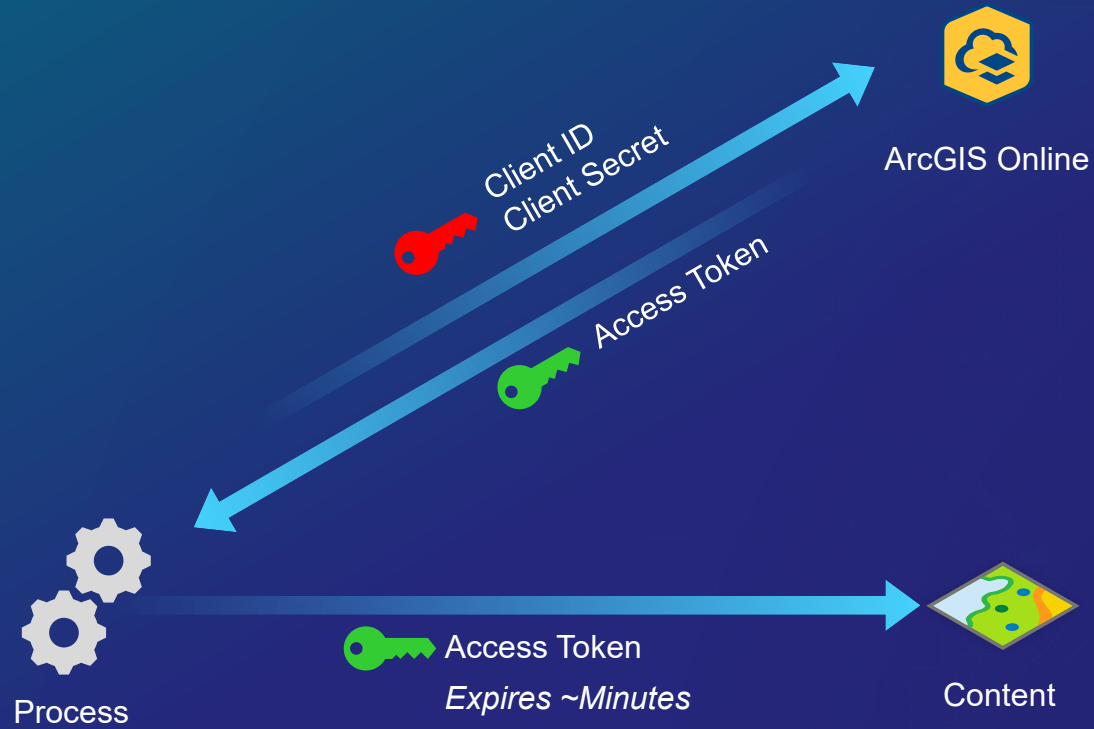
Machine Authentication

API Keys



Machine Authentication

App Auth



```
import os
import requests

TOKEN_URL = "https://www.arcgis.com/sharing/rest/oauth2/token" # ArcGIS Online /

client_id = os.environ.get("CLIENT_ID")
client_secret = os.environ.get("CLIENT_SECRET")

data = {
    "client_id": client_id,
    "client_secret": client_secret,
    "grant_type": "client_credentials", # per client credentials flow [1](https:
    "f": "json"

resp = requests.post(TOKEN_URL, data=data, timeout=30)
resp.raise_for_status()

token_payload = resp.json()

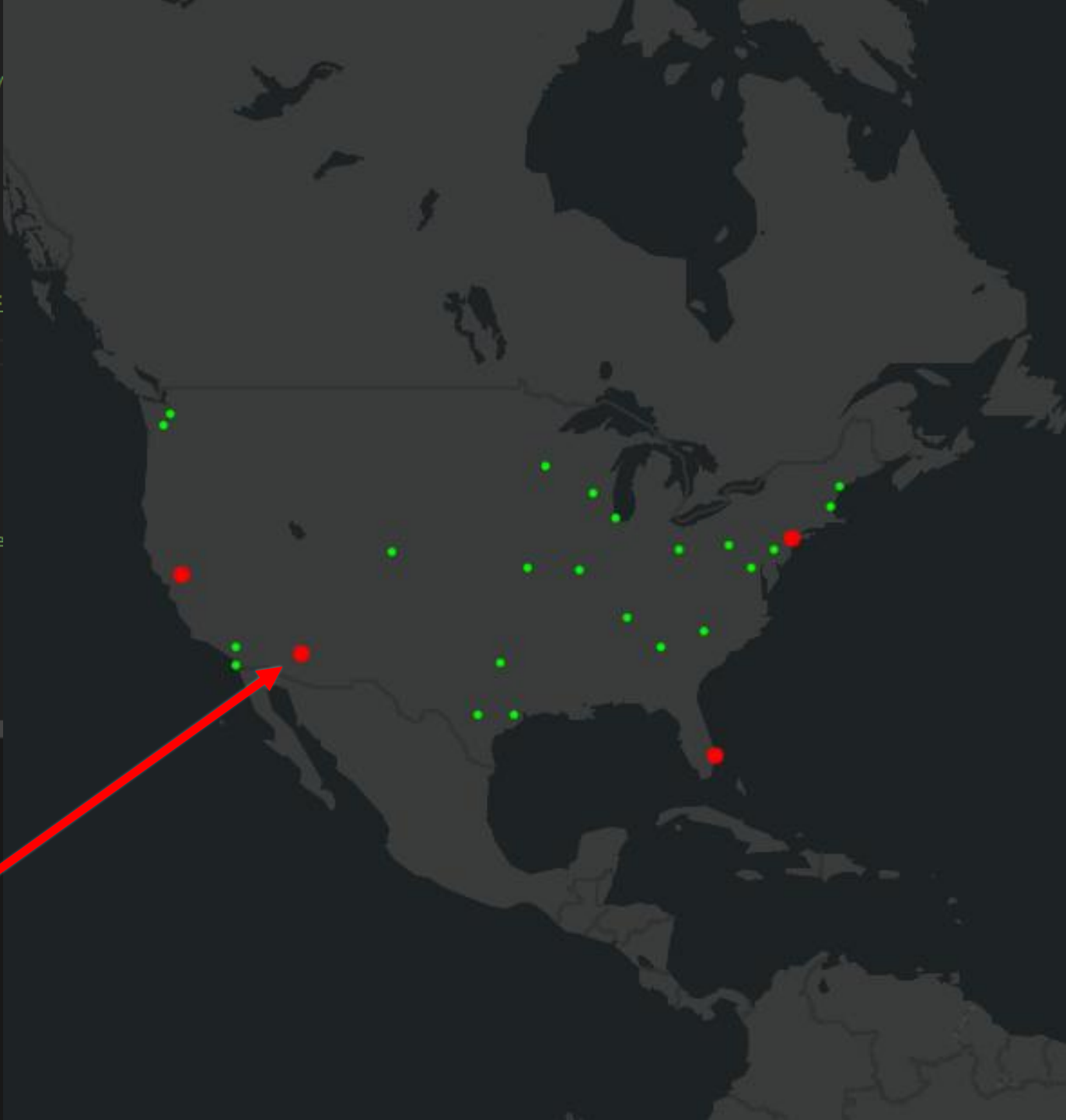
# ArcGIS returns "access_token" and "expires_in" in the response (successful case)
access_token = token_payload.get("access_token")
expires_in = token_payload.get("expires_in")

if not access_token:
    raise RuntimeError(f"Token request failed: {token_payload}")

print("access token:", access_token)
```

OBLEMS OUTPUT TERMINAL PORTS

```
updateResults': [{'objectId': 3, 'uniqueId': 3, 'globalId': None, 'success': True}]]
updateResults': [{'objectId': 4, 'uniqueId': 4, 'globalId': None, 'success': True}]]
updateResults': [{'objectId': 5, 'uniqueId': 5, 'globalId': None, 'success': True}]]
updateResults': [{'objectId': 6, 'uniqueId': 6, 'globalId': None, 'success': True}]]
updateResults': [{'objectId': 7, 'uniqueId': 7, 'globalId': None, 'success': True}]]
updateResults': [{'objectId': 8, 'uniqueId': 8, 'globalId': None, 'success': True}]]
updateResults': [{'objectId': 9, 'uniqueId': 9, 'globalId': None, 'success': True}]]
updateResults': [{'objectId': 10, 'uniqueId': 10, 'globalId': None, 'success': True}]]
updateResults': [{'objectId': 11, 'uniqueId': 11, 'globalId': None, 'success': True}]]
updateResults': [{'objectId': 12, 'uniqueId': 12, 'globalId': None, 'success': True}]]
updateResults': [{'objectId': 13, 'uniqueId': 13, 'globalId': None, 'success': True}]]
updateResults': [{'objectId': 14, 'uniqueId': 14, 'globalId': None, 'success': True}]]
updateResults': [{'objectId': 15, 'uniqueId': 15, 'globalId': None, 'success': True}]]
```



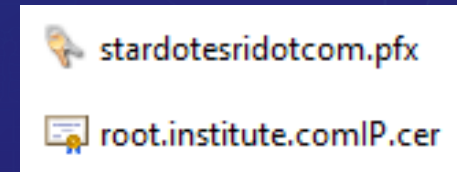
Certificates with Let's Encrypt/Certbot



Certificates Background

How do certificates work?

- Two main purposes of certificates
 - Encryption (private key certificates)
 - Trust (public key certificates or certificate chains)



Certificates Background

How do certificates work?

**Certifying
Authority
(CA)**



Issues the
Root
Certificate

**Root
Certificate**



Issues the
Intermediate
Certificate

**Intermediate
Certificate
(optional)**



Issues the
Leaf Entity
Certificate

**Leaf Entity
Certificate**



**Private
Encryption
Key**



Certificates Background

These certificates are used to build a chain of **trust** back to the certifying authority

Certifying
Authority
(CA)



Root
Certificate



Intermediate
Certificate
(optional)

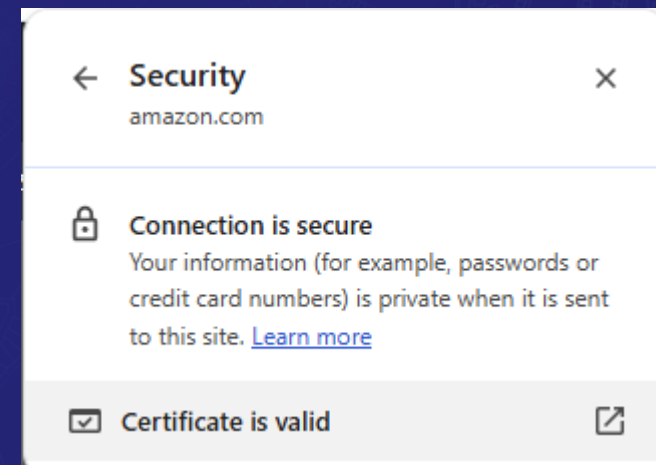


Leaf Entity
Certificate



What's at stake if a connection isn't trusted?

- Can't guarantee that targeted server/website is legitimate



Certificates Background

This certificate is used to **encrypt** traffic sent to the server(s) listed on it

**Certifying
Authority
(CA)**



**Root
Certificate**



**Intermediate
Certificate
(optional)**



**Leaf Entity
Certificate**

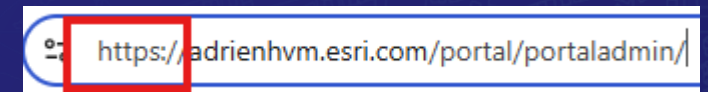


**Private
Encryption
Key**



What's at stake if a connection isn't encrypted?

- Traffic may be sent to server/website unencrypted and intercepted
- Traffic may fail to be sent if HTTPS is enforced



Import Existing Server Certificate

Certificate password:

Certificates Background

An analogy...

**Certifying
Authority
(CA)**



**Root
Certificate**



**Leaf Entity
Certificate**





**Private
Encryption
Key**



Amazon

Top reviews from the United States

★★★★★ **Excellent clarity and a perfect secondary monitor**
Reviewed in the United States on January 16, 2026

Verified Purchase

Enter mobile number or email

Continue

Password [Forgot password?](#)

Sign in

What's at stake if a reviewer's purchase hasn't been verified?

- Product influence and reputation (positive or negative)

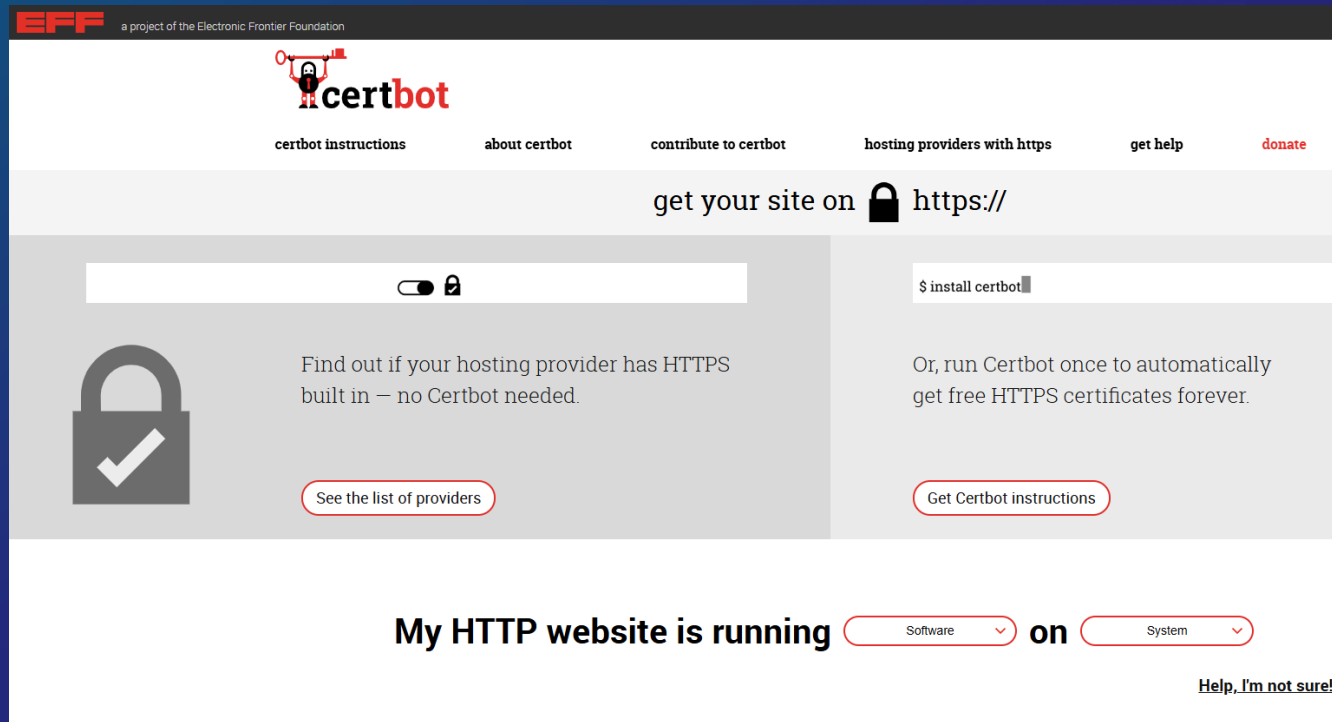
Let's Encrypt/Certbot


- Public CA (free)
- Requirements:
 - Access to a DNS service
 - Ability to add temporary records to the DNS service
 - Certbot installed locally

Let's Encrypt/Certbot

Install Certbot

- Download installer from <https://certbot.eff.org/> and run installer



The screenshot shows the Certbot website homepage. At the top left is the EFF logo with the text "a project of the Electronic Frontier Foundation". The Certbot logo, featuring a robot character, is centered. A navigation bar contains links for "certbot instructions", "about certbot", "contribute to certbot", "hosting providers with https", "get help", and "donate". Below the navigation bar, the text "get your site on  https://" is displayed. A search bar with a lock icon is positioned above a large grey box. The grey box is split into two columns. The left column features a lock icon with a checkmark and the text "Find out if your hosting provider has HTTPS built in – no Certbot needed." Below this is a button labeled "See the list of providers". The right column features a search bar with the text "\$ install certbot" and the text "Or, run Certbot once to automatically get free HTTPS certificates forever." Below this is a button labeled "Get Certbot instructions". At the bottom of the page, the text "My HTTP website is running" is followed by a dropdown menu showing "Software", the word "on", another dropdown menu showing "System", and a link "Help, I'm not sure!".

Let's Encrypt/Certbot

Use Certbot to generate certificate

- Using Command Prompt (Windows) or the terminal (Linux/MacOS), navigate to the install directory for Certbot and enter this command:

```
certbot certonly -manual -preferred-challenges=dns -email <youremailaddress> --server https://acme-v02.api.letsencrypt.org/directory --agree-tos -d <*.yourdomain>
```

```
C:\Program Files\Certbot\bin>certbot certonly --manual --preferred-challenges=dns --email ahafner@esri.com --server https://acme-v02.api.letsencrypt.org/directory --agree-tos -d *.aes-ps.com
Saving debug log to C:\Certbot\log\letsencrypt.log
Requesting a certificate for *.aes-ps.com

-----
Please deploy a DNS TXT record under the name:
_acme-challenge.aes-ps.com.
with the following value:
iYfNxrFIDKN7wBH5gXbfei01T50G6v7rkwHK_Bi_N7k
Before continuing, verify the TXT record has been deployed. Depending on the DNS provider, this may take some time, from a few seconds to multiple minutes. You can check if it has finished deploying with aid of online tools, such as the Google Admin Toolbox: https://toolbox.googleapps.com/apps/dig/#TXT/_acme-challenge.aes-ps.com. Look for one or more bolded line(s) below the line ';ANSWER'. It should show the value(s) you've just added.
-----
Press Enter to Continue
```

Let's Encrypt/Certbot

Create temporary DNS TXT record

The image shows a screenshot of the AWS Route 53 console. On the left, the 'Hosted zone details' for 'aes-ps.com' is visible, with a list of records. The record '_acme-challenge.aes-ps.com' is selected. On the right, the 'Edit record' modal is open, showing the configuration for this record.

Public aes-ps.com Info

▶ **Hosted zone details**

Records (21) | Accelerated recovery | DNSSEC signing | Hosted zone tags

Records (1/21) Info

Automatic mode is the current search behavior optimized for best filter results. [To change modes go](#)

🔍 Filter records by property or value

Record name
<input type="checkbox"/> aes-ps.com
<input type="checkbox"/> aes-ps.com
<input checked="" type="checkbox"/> _acme-challenge.aes-ps.com

Edit record ⚙️ | ➔

Record name | Info

.aes-ps.com

Keep blank to create a record for the root domain.

Record type | Info

▼

Alias

Value | Info

Enter multiple values on separate lines. You can separate long strings into separate lines by appending a space at the end before you continue the string on the next line.

TTL (seconds) | Info

Recommended values: 60 to 172800 (two days)

Routing policy | Info

▼

Let's Encrypt/Certbot

Confirm temporary DNS TXT record is publicly available for Certbot

```
C:\Program Files\Certbot\bin>certbot certonly --manual --preferred-challenges=dns --email ahafner@esri.com --server https://acme-v02.api.letsencrypt.org/directory --agree-tos -d *.aes-ps.com
Saving debug log to C:\Certbot\log\letsencrypt.log
Requesting a certificate for *.aes-ps.com

-----
Please deploy a DNS TXT record under the name:
_acme-challenge.aes-ps.com.
with the following value:
iYfNxrFIDKN7wBH5gXbfe i01T50G6v7rkwHK_Bi_N7k
Before continuing, verify the TXT record has been deployed. Depending on the DNS
provider, this may take some time, from a few seconds to multiple minutes. You can
check if it has finished deploying with aid of online tools, such as the Google
Admin Toolbox: https://toolbox.googleapps.com/apps/dig/#TXT/_acme-challenge.aes-ps.com.
Look for one or more bolded line(s) below the line ';ANSWER'. It should show the
value(s) you've just added.
-----
Press Enter to Continue

Administrator: Command Prompt

C:\Windows\System32>nslookup -q=TXT _acme-challenge.aes-ps.com
Server: RT-BE92U-7270
Address: 192.168.50.1

Non-authoritative answer:
_acme-challenge.aes-ps.com      text =
    "iYfNxrFIDKN7wBH5gXbfe i01T50G6v7rkwHK_Bi_N7k"

C:\Windows\System32>
```

Let's Encrypt/Certbot

Continue with certificate creation process

```
Administrator: Command Prompt
iYfNxrFIDKN7wBH5gXbfEi0IT50G6v7rkWHK_Bi_N7k

Before continuing, verify the TXT record has been deployed. Depending on the DNS
provider, this may take some time, from a few seconds to multiple minutes. You can
check if it has finished deploying with aid of online tools, such as the Google
Admin Toolbox: https://toolbox.googleapps.com/apps/dig/#TXT/_acme-challenge.aes-ps.com.
Look for one or more bolded line(s) below the line ';ANSWER'. It should show the
value(s) you've just added.

-----
Press Enter to Continue

Successfully received certificate.
Certificate is saved at: C:\Certbot\live\aes-ps.com-0001\fullchain.pem
Key is saved at:      C:\Certbot\live\aes-ps.com-0001\privkey.pem
This certificate expires on 2026-05-13.
These files will be updated when the certificate renews.

NEXT STEPS:
- This certificate will not be renewed automatically. Autorenewal of --manual certificates requires the use of an authen-
tication hook script (--manual-auth-hook) but one was not provided. To renew this certificate, repeat this same certbot
command before the certificate's expiry date.

-----
If you like Certbot, please consider supporting our work by:
* Donating to ISRG / Let's Encrypt: https://letsencrypt.org/donate
* Donating to EFF:                  https://eff.org/donate-le

-----
C:\Program Files\Certbot\bin>
```

> This PC > OS (C:) > Certbot > live > aes-ps.com-0001

Name	Date modified	Type	Size
cert.pem	2/12/2026 9:04 AM	.symlink	0 KB
chain.pem	2/12/2026 9:04 AM	.symlink	0 KB
fullchain.pem	2/12/2026 9:04 AM	.symlink	0 KB
privkey.pem	2/12/2026 9:04 AM	.symlink	0 KB
README	2/12/2026 9:04 AM	File	1 KB

Let's Encrypt/Certbot

Optional – use OpenSSL to create .pfx file from generated certificates

```
2. WSL-Ubuntu
:~$ cd /mnt/c/Certbot/live/aes-ps.com-0001/
:/mnt/c/Certbot/live/aes-ps.com-0001$ openssl pkcs12 -export -out newcert.pfx -inkey privkey.pem -in fullchain.pem
Enter Export Password:
Verifying - Enter Export Password:
:/mnt/c/Certbot/live/aes-ps.com-0001$
```

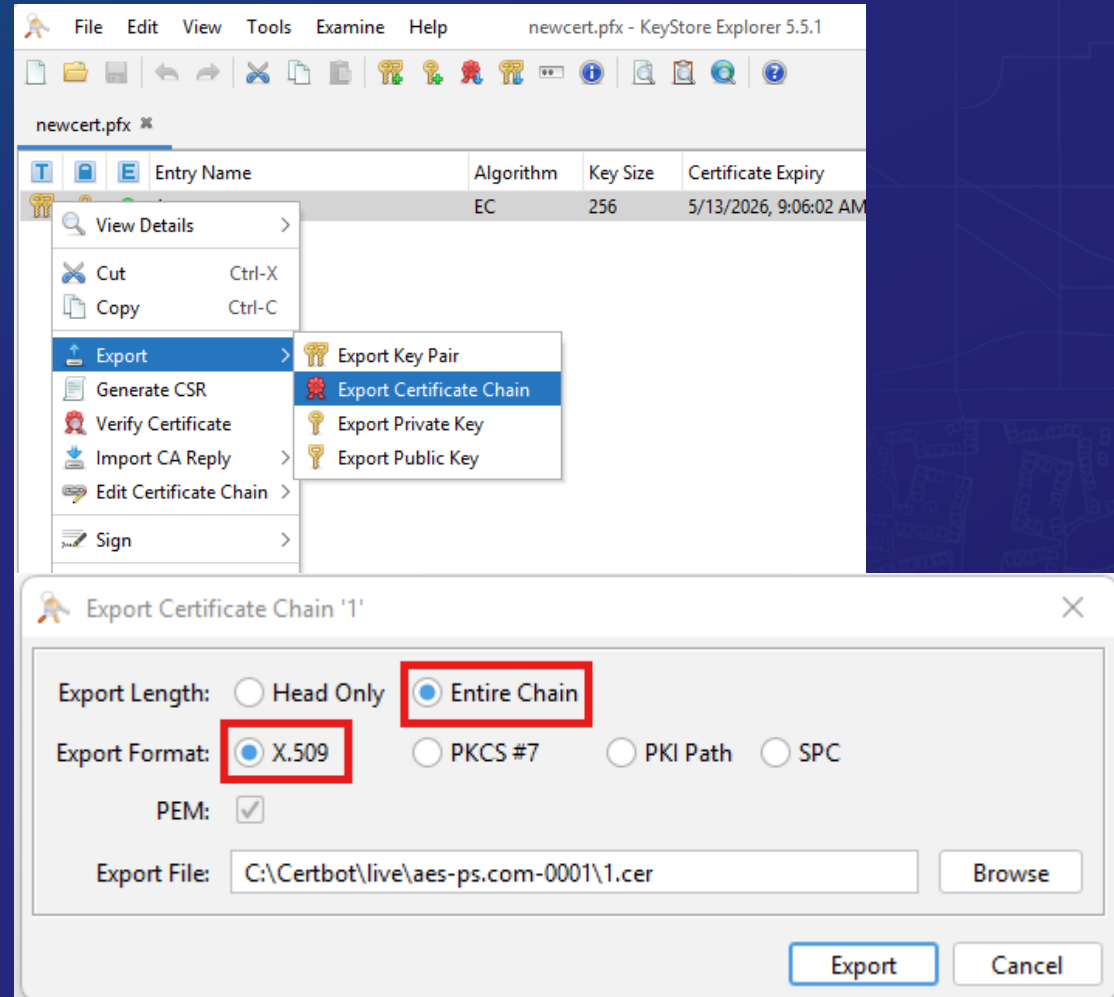
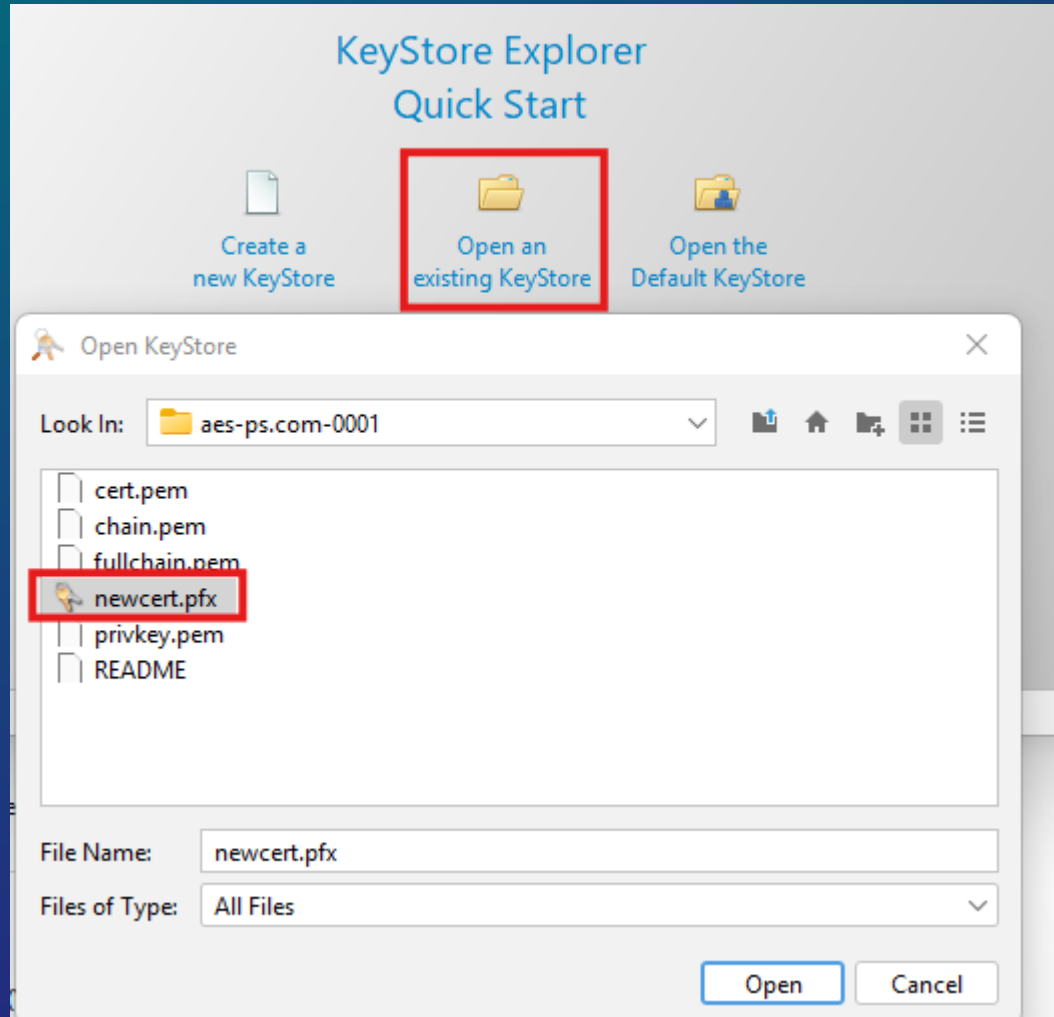
> This PC > OS (C:) > Certbot > live > aes-ps.com-0001

Sort View ...

Name	Date modified	Type	Size
cert.pem	2/12/2026 9:04 AM	.symlink	0 KB
chain.pem	2/12/2026 9:04 AM	.symlink	0 KB
fullchain.pem	2/12/2026 9:04 AM	.symlink	0 KB
newcert.pfx	2/12/2026 9:15 AM	PFX File	3 KB
privkey.pem	2/12/2026 9:04 AM	.symlink	0 KB
README	2/12/2026 9:04 AM	File	1 KB

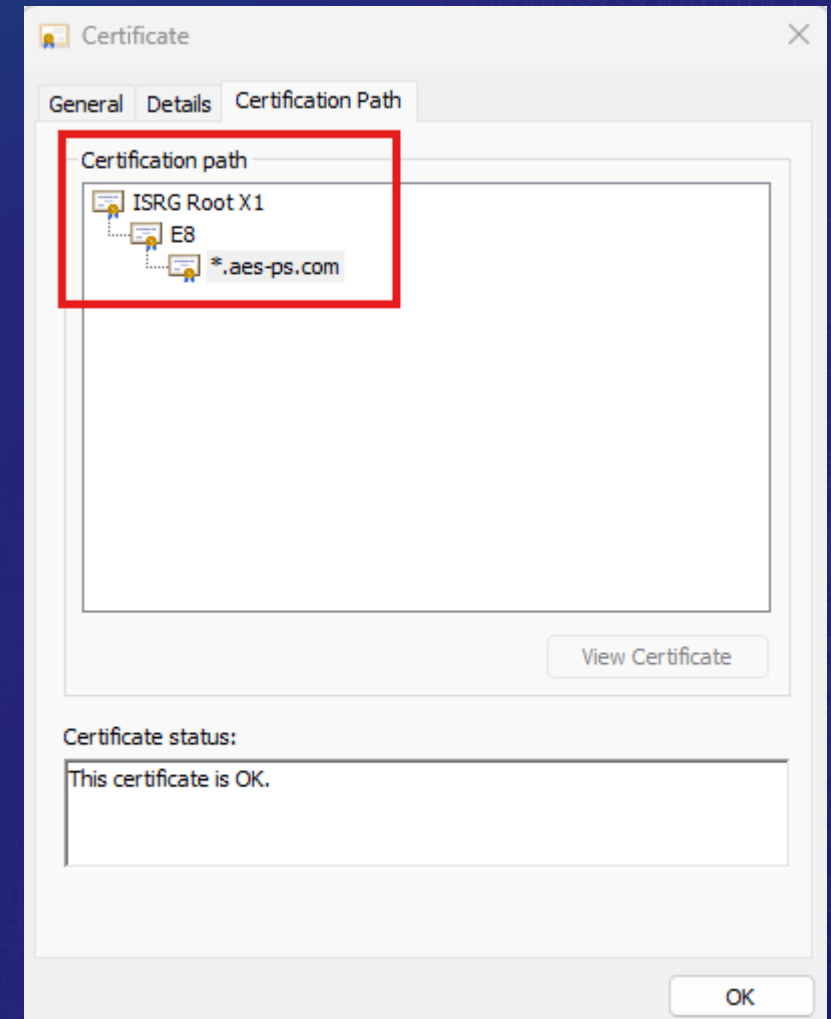
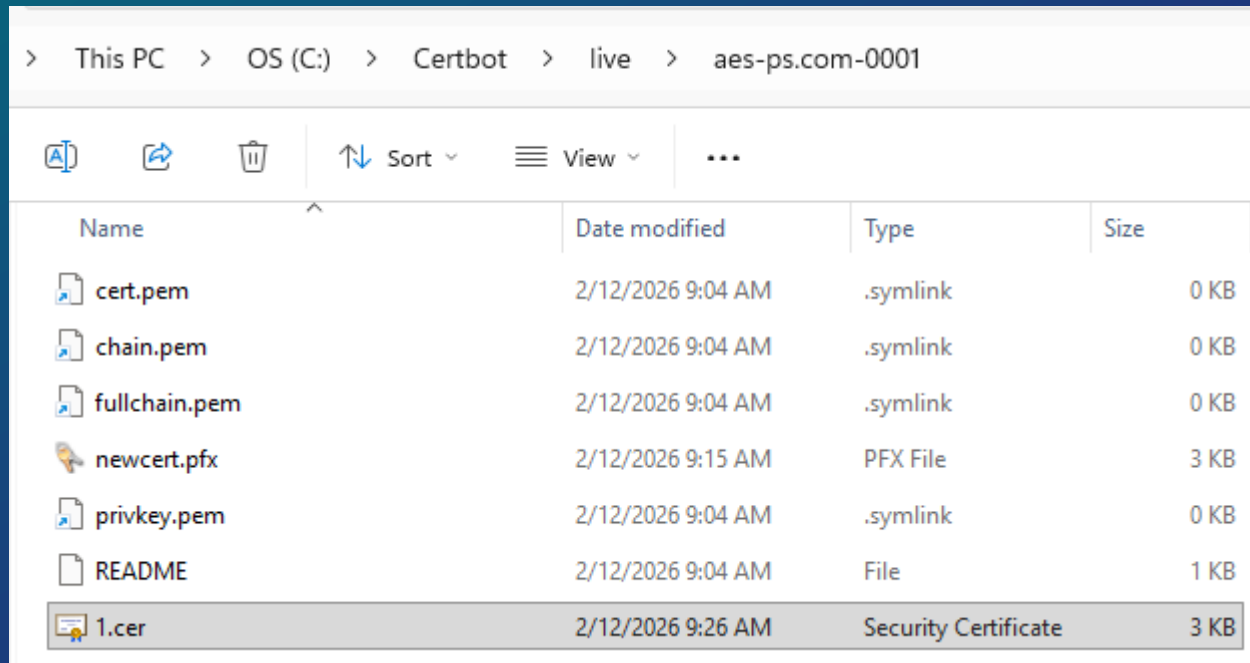
Let's Encrypt/Certbot

Optional – use Keystore Explorer to export .cer/.crt chains



Let's Encrypt/Certbot

Optional – use Keystore Explorer to export .cer/.crt chains



Compliance



ARCGIS ONLINE (AGO)



Package ID

FR1811073663A

Package Request Form

Authorizations ¹

14

Reuse ¹

16

Authorization Status ¹



Authorization Details ¹

FedRAMP Ready: No FRR Date

Authorizing Entity Review: 04/04/2023

PMO Review: 05/08/2023

FedRAMP Authorized: 07/22/2024

System Profile ¹

Service Model: SaaS

Deployment Mode: Public Cloud

Impact Level: Moderate

Compliance

FedRAMP – ArcGIS Online

- ArcGIS Online FedRAMP Authorized 8 years!
- Initial 2018 FedRAMP Tailored Low Rev 4
- 2024 – Moderate
 - NIST 800-53 Rev 5 Controls
 - Supply chain
 - Red team
 - Cross-agency Collaborative ConMon
 - New Customer Responsibilities
 - Expands coverage to PII, CUI and CDI requirements



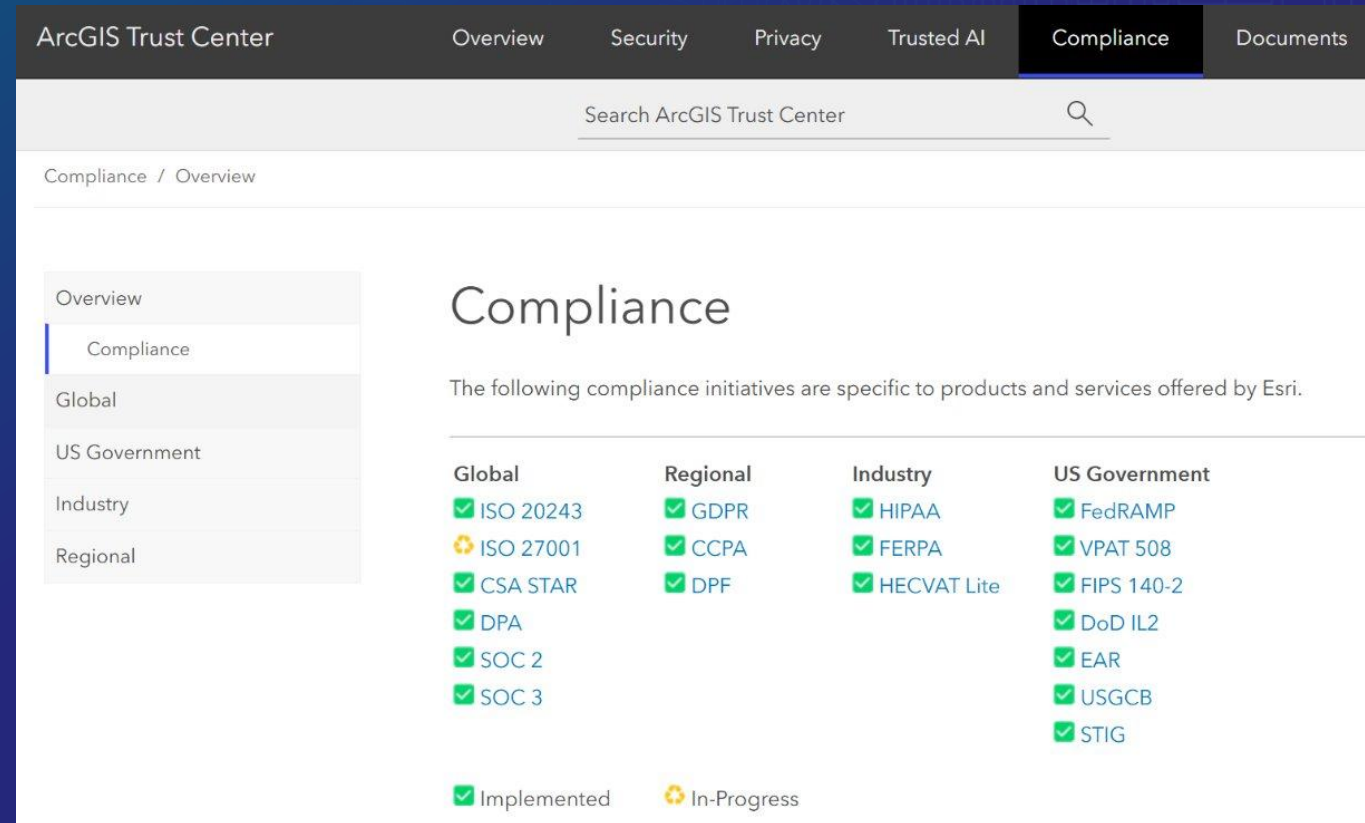
Stronger security & privacy assurance means agencies can expand use case scenarios of ArcGIS Online!

trust.arcgis.com

Compliance

Beyond FedRAMP

- Privacy regulations
- Health care (HIPAA)
 - Eligible services expanding
 - BAA Available
- Accessibility (VPAT / WCAG)
- DoD Public Data (IL2) Reciprocity
 - Welcome discussing DoD IL4 demands



ArcGIS Trust Center

Overview Security Privacy Trusted AI **Compliance** Documents

Search ArcGIS Trust Center

Compliance / Overview

Overview

Compliance

Global

US Government

Industry

Regional

Compliance

The following compliance initiatives are specific to products and services offered by Esri.

Global	Regional	Industry	US Government
✓ ISO 20243	✓ GDPR	✓ HIPAA	✓ FedRAMP
✚ ISO 27001	✓ CCPA	✓ FERPA	✓ VPAT 508
✓ CSA STAR	✓ DPF	✓ HECVAT Lite	✓ FIPS 140-2
✓ DPA			✓ DoD IL2
✓ SOC 2			✓ EAR
✓ SOC 3			✓ USGCB
			✓ STIG

✓ Implemented ✚ In-Progress

Check out the ArcGIS Trust Center Compliance page to explore more!

trust.arcgis.com

Summary

Compliance: [ArcGIS Online = FedRAMP Moderate Authorized](#)

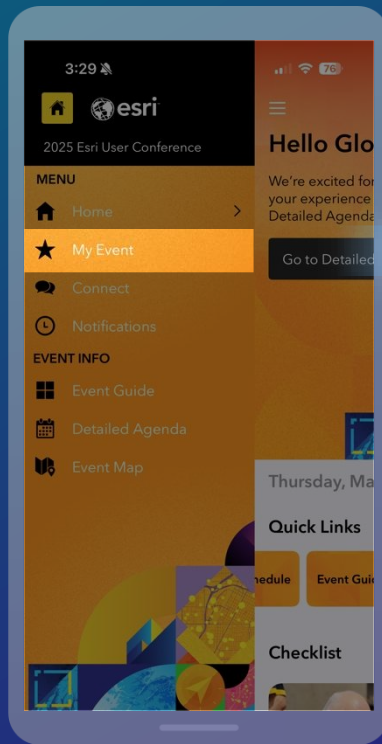
Guidance: [ArcGIS Enterprise Hardening Guide](#), [ArcGIS Security and Privacy Adviser](#), [Zero Trust Architecture](#)

Demos: [Automation & Authentication](#), [Creating Certificates with Let's Encrypt](#)

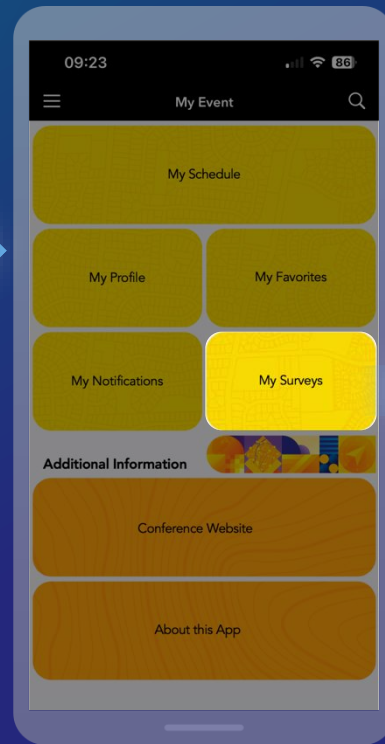


Please share your feedback in the app

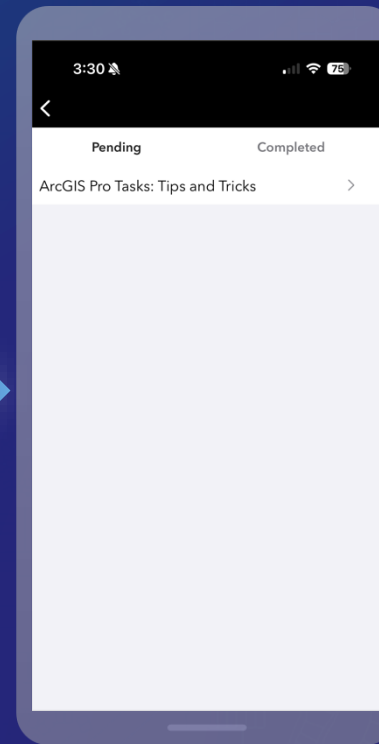
Select "My Event" in the event app main menu



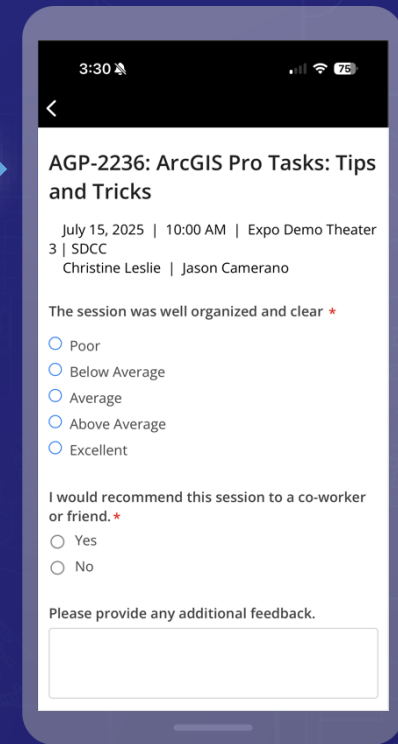
Select "My Surveys"



Select the desired survey



Complete the survey



Connect with us on social

Join the conversation using [#EsriDevTech2026](#)



x.com/EsriDevs



x.com/EsriDevEvents



youtube.com/@EsriDevs



links.esri.com/DevVideos



github.com/Esri



github.com/EsriDevEvents



links.esri.com/EsriDevCommunity

Questions





```
map = new Map(BasemapStyle.ArcGISNavigation);
initialViewpoint = new Viewpoint(40.72,
-73.995,
72000);
mapView.Map = map;
```

```
struct ContentView: View {
    @State private var map = {
        let map = Map(
            basemapStyle: .arcGISNavigation
        )

        map.initialViewpoint = Viewpoint(
            latitude: 40.72,
            longitude: -73.995,
            scale: 72_000
        )

        return map
    }()

    var body: some View {
        MapView(map: map)
    }
}
```



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