dreamforce 20 Years

GROUNDSWELL CLOUD SOLUTIONS
a GyanSys company

Named Credentials

Securing and Simplifying API Callouts

Pei Huang, CTO Salesforce Practice
pei@gscloudsolutions.com

Pei Huang

CTO, Salesforce Practice
Groundswell Cloud Solutions Inc
(a GyanSys Company)

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Agenda

- Background
- Common Options for Credential Storage
- Why Named Credentials?
- Examples
- Advanced Use Cases
- What's New in Named Credentials
- Recap and Resources

What are Callouts?

HTTP Callouts

Apex to integrate Salesforce with external systems via API

- Legacy or 3rd party back office applications - REST, SOAP APIs or even scraping web pages
- Online services such as Stripe.com for payment processing, Twilio.com for SMS/telephony, JIRA for Bug Tracking

```
HttpRequest req = new HttpRequest();
req.setEndpoint('https://example.com/path/to/my/fancy/api');
req.setMethod('GET');
Http h = new Http();
HttpResponse res = h.send(req);
```

Authenticating Callouts

Securing Your Integrations

Many APIs will require authentication

- Can’t let just anyone access the API (think: confidential data, sensitive commercial secrets)

Different credentials for different environments

- Production, test, dev ... and others?

Different authentication mechanisms

- Password based
- JWT Tokens
- Secret keys
- OAuth 2.0
- AWS Signatures
- Custom Authentication Schemes

Named Principal or Per-User

- System/integration user, or different credentials per user

Hardcoding Credentials

“Why can’t I just put usernames and passwords in my Apex code?”

Maintenance Nightmare™

- What if the password has to be changed (e.g. password expires every 90 days)? Deploy code changes every time

Difficult to maintain changes in different environments

- How do you maintain different credentials between Development, QA, Staging, and Production orgs?

Not very secure!

- Code committed to Git; credentials visible to everyone
- Sandbox refresh, important production credentials become visible in plaintext to developers and others

Custom Settings, Objects, or Labels

“But what if I put it in a protected custom setting to keep it safe?”

“But what if I use Custom Labels to store my credentials?”

Store credentials inside a Custom Setting/Metadata Type/Object

- Can avoid hard-coding this way
- Have to implement your own utility classes

Not really intended to store secrets

- Custom Labels are intended for localization, not for credentials
- Some unexpected ways to get access to custom settings


“Named credentials … offloads the storage of credentials and authentication to a declaratively controlled process.”
Kevin Poorman
Salesforce MVP | @codefriar | codefriar.com

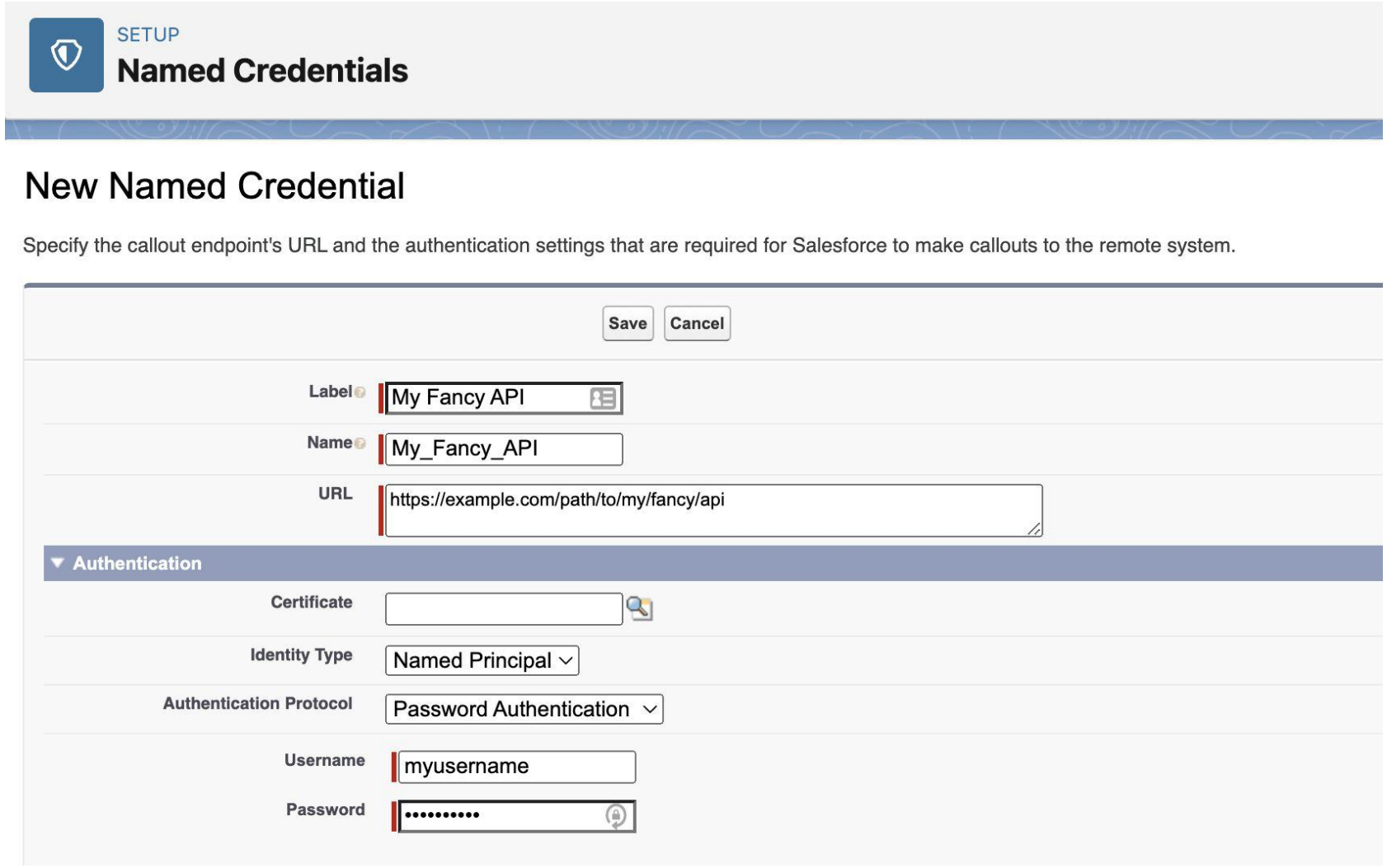
Basic Auth Example

The Traditional Way

```
HttpRequest req = new HttpRequest();
req.setEndpoint('https://example.com/path/to/my/fancy/api');
req.setMethod('GET');

String username = 'myusername';
String password = 'mypassword'; // Or retrieve from Custom Setting

Blob headerValue = Blob.valueOf(username + ':' + password);
String authorizationHeader = 'BASIC ' +
EncodingUtil.base64Encode(headerValue);

req.setHeader('Authorization', authorizationHeader);

Http h = new Http();
HttpResponse res = h.send(req);
```

Basic Auth Example

Create a Named Credential



Basic Auth Example

With Named Credentials

```
HttpRequest req = new HttpRequest();
req.setEndpoint('callout:My_Fancy_API/something');
req.setMethod('GET');
// No need to manually set any headers here. Salesforce will add this for us automatically
Http h = new Http();
HttpResponse res = h.send(req);
```

Complexity of OAuth 2.0

A Secure Industry Standard

Multiple steps with consumer keys/client IDs, client secrets, callbacks, scopes, access tokens, refresh tokens….

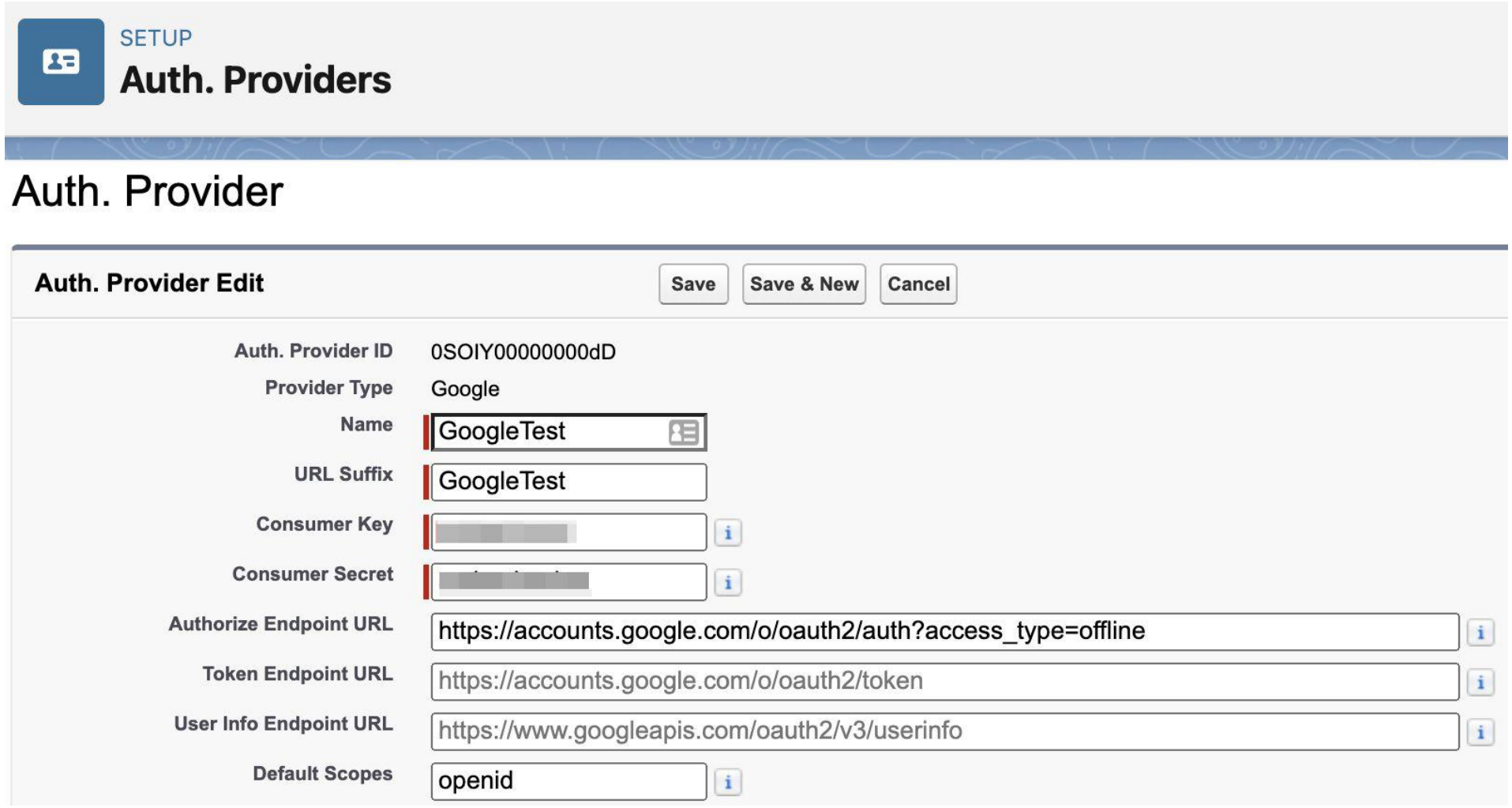
- Many moving parts

Token expiry and refresh

- Handing of refresh_token when sessions expire requires an extra step

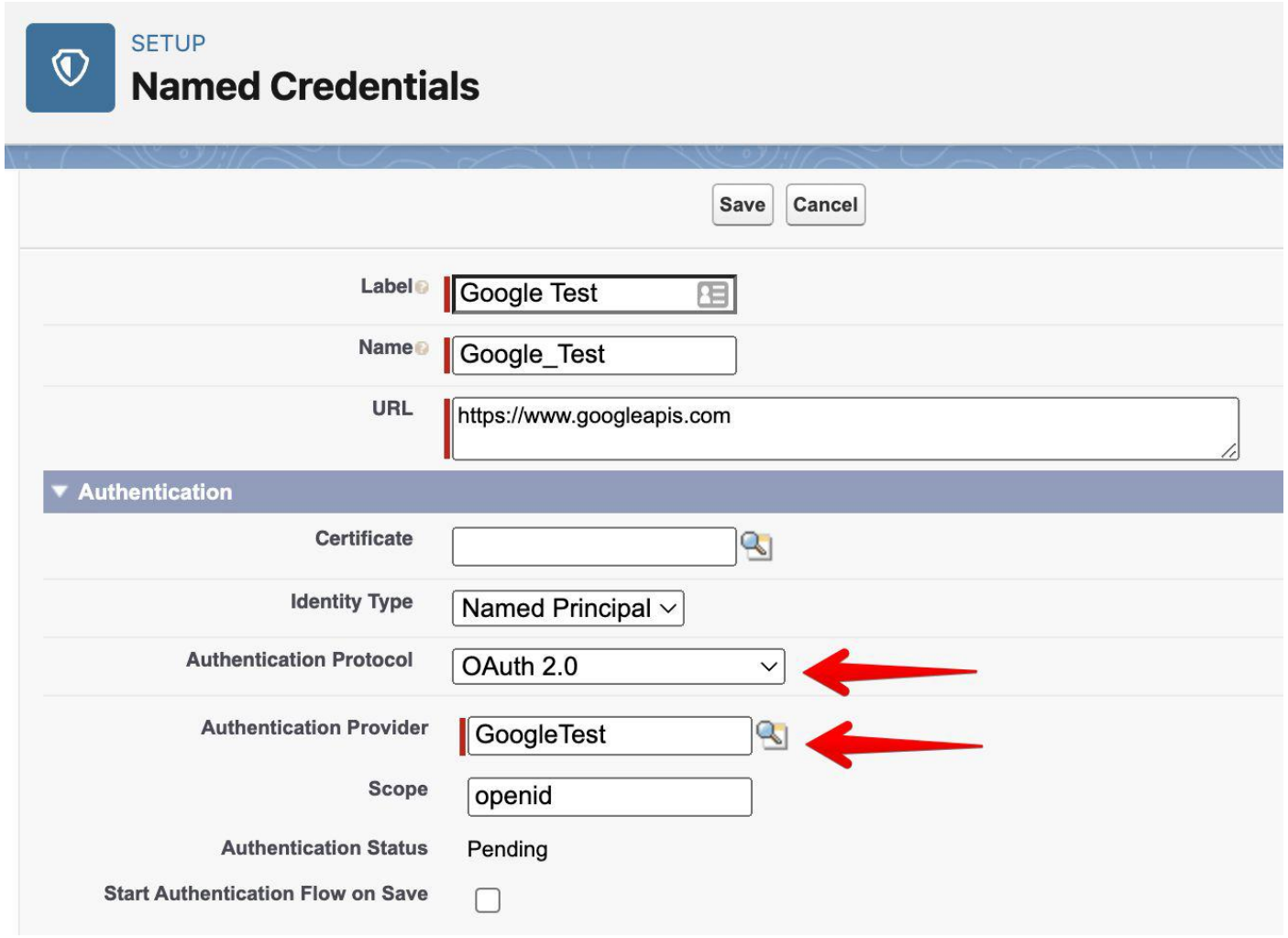
OAuth Example

Create Auth. Provider



OAuth Example

Create Named Credential



OAuth Example

Authenticate Named Credential

SETUP

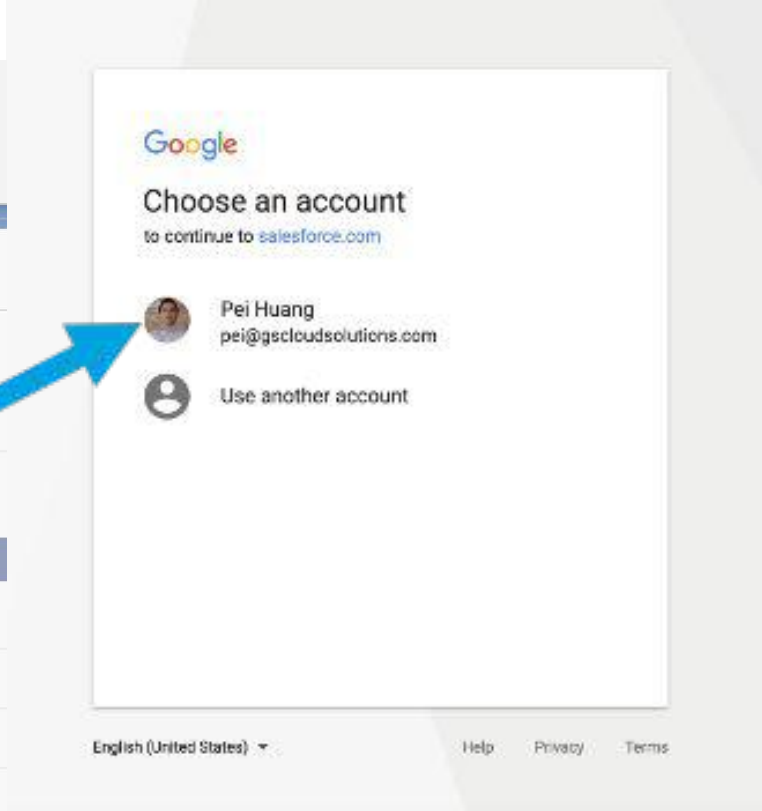
Named Credentials

Save | Cancel

Label	Google Test
Name	Google_Test
URL	https://www.googleapis.com

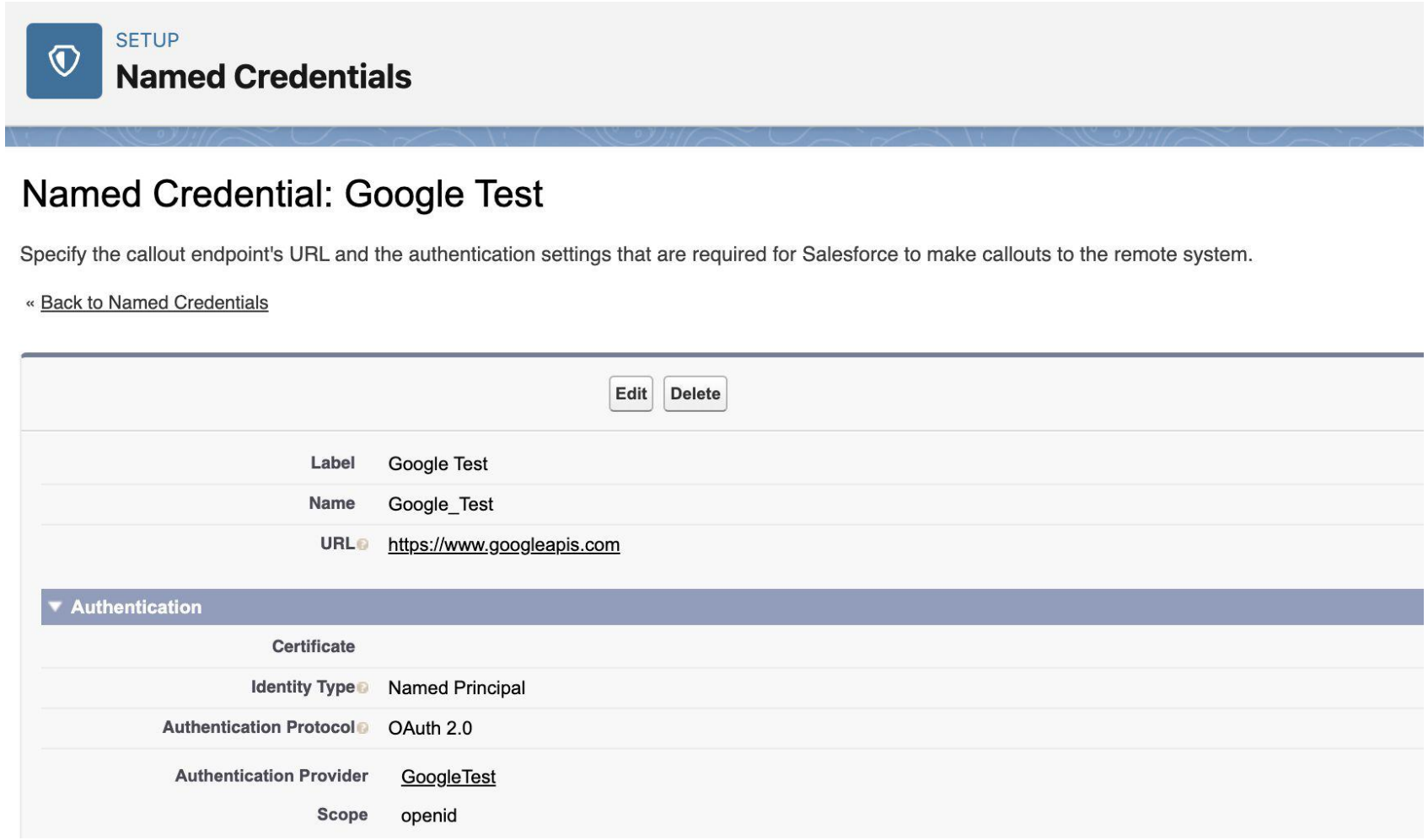
Authentication

Certificate	
Identity Type	Named Principal
Authentication Protocol	OAuth 2.0
Authentication Provider	GoogleTest
Scope	openid
Authentication Status	Pending
Start Authentication Flow on Save	☑



OAuth Example

Named Credential Is Ready To Go!



OAuth Example – With Named Credentials

Simple Code

```
HttpRequest req = new HttpRequest();
req.setEndpoint('callout:Google_Test/oauth2/v3/userinfo');
req.setMethod('GET');
// No need to manually set any headers here.
// Notice how similar this code looks to the Username/Password Example?
Http h = new Http();
HttpResponse res = h.send(req);
```

OAuth 2.0 with Named Credentials

What Salesforce Does for You

Handles Web-Server Flow Via Declarative Setup Screens

- 100% declarative setup process.- no code required

Generates and Appends the Authorization Header

- Authorization Bearer header is automatically added to your HTTP request

Refresh OAuth Access Token

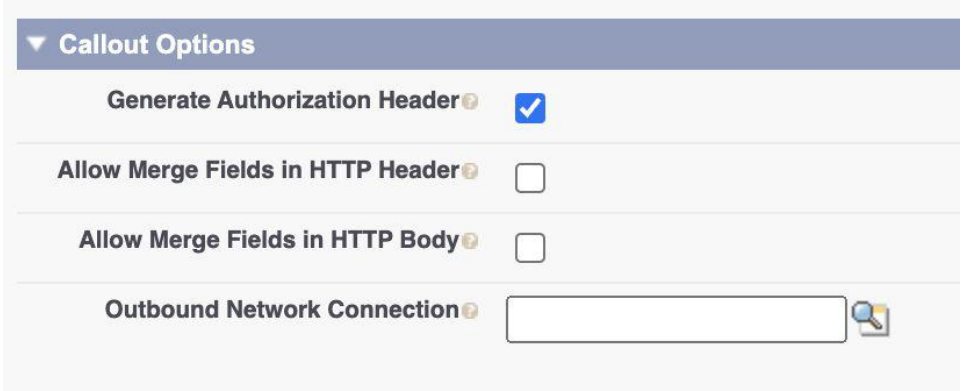
- Salesforce will handle the refresh flow for you

Merge Fields

What About APIs That Don't Use The Authorization Header?

Generate Authorization Header

- Default – generates the Authorization header added to the HTTP request for you



Allow Merge Fields in HTTP Header

- Set your own custom header using values from the Named Credential – e.g. custom X-Auth headers or similar

Allow Merge Fields in HTTP Body

- Set your own custom values in an HTTP body – e.g. SOAP API with Salesforce's Metadata API

Merge Fields

Most Useful Merge Fields

Merge Fields	Description	Example

{!$Credential.Username}
{!$Credential.Password}
	Username and password of the running user. Available only if the named credential uses password authentication.	`// non-standard authentication`
		`req.setHeader('X-Username', '{!$Credential.UserName}');`
		`req.setHeader('X-Password', '{!$Credential.Password}');`

{!$Credential.OAuthToken}	OAuth token of the running user. Available only if the named credential uses OAuth authentication.	

For full list, refer to
https://developer.salesforce.com/docs/atlas.en-us.apexcode.meta/apexcode/apex_callouts_named_credentials_merge_fields.htm

SOAP Example

Using Apex Wrapper for Metadata API

```
MetadataService.MetadataPort service = new
                    MetadataService.MetadataPort();
service.SessionHeader = new MetadataService.SessionHeader_element();
service.endpoint_x = 'callout:ApexMDAPI/services/Soap/m/41.0';
service.SessionHeader.sessionId = '{!$Credential.OAuthToken}';

// By using Named Credentials, we can now call Salesforce SOAP APIs
from batch classes and other contexts easily where a first-class
session ID is not readily available
```

Ref: My blog post at
https://gscloudsolutions.com/tips-tricks/using-named-credentials-with-the-apex-wrapper-salesforce-metadata-api/

Other Benefits

Why you should always use Named Credentials

No need to add Remote Site Settings

- Skip Remote Site Settings if you are using Named Credentials

Can reference the same Named Credential name in code across environments

- No need to change anything in your code when moving between environments – simply update the Named Credential in Setup

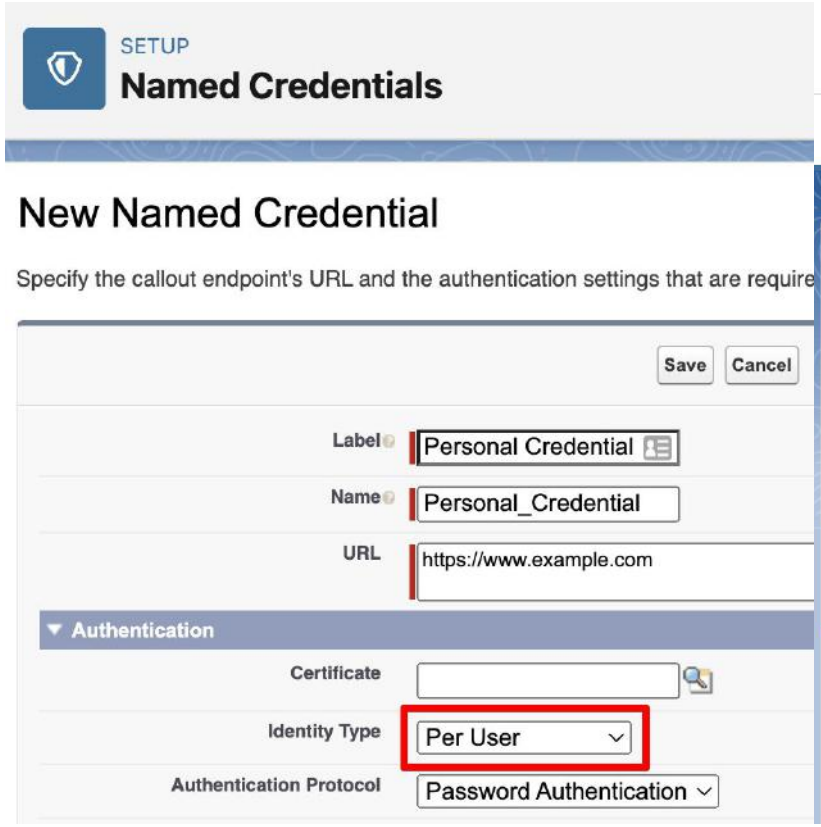
Easy for admins to maintain

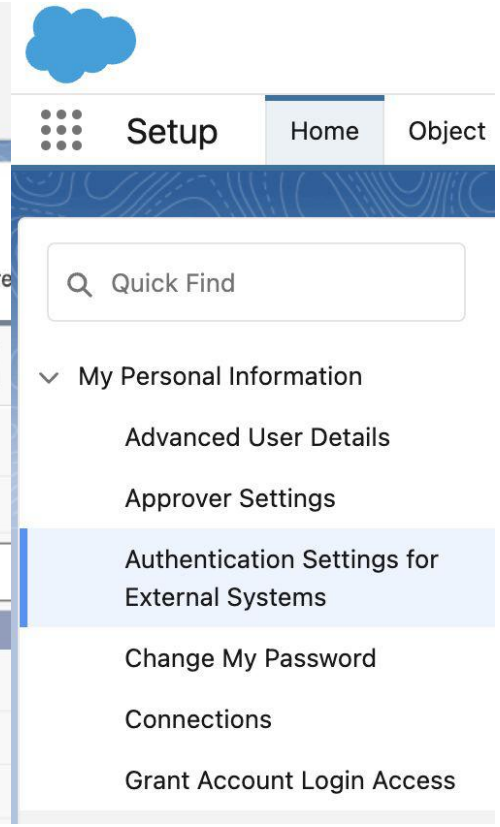
- Developers can remain at arms-length of production credentials at all time

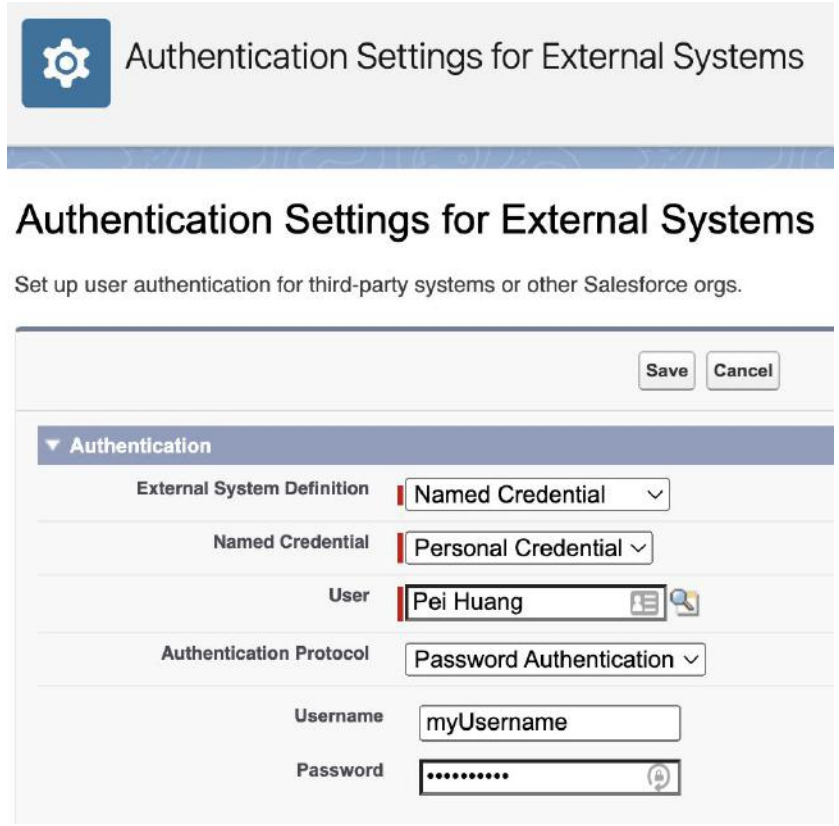
Secure storage of credentials in Salesforce

- Secrets are stored securely by Salesforce – no need to reinvent the wheel

Per User Credentials







Recap

Named Credentials Are Awesome!

Named Credentials solve the common problem of storing and maintaining credentials used for API integrations in Salesforce

- Simplifies and streamlines your code

Don’t hard code your credentials in Apex!

- Maintenance, maintenance, maintenance

Empower admins to maintain and manage credentials

Secure storage of credentials in Salesforce

- Basic
- OAuth 2.0
- Custom schemes via merge fields

Did You Know?

A lot has changed in Named Credentials in last couple of years

New Authentication Protocols (Summer ‘19):

- AWS Signature V4
- JWT
- JWT Token Exchange

Outbound Connections via Private Connect (Summer ‘20)

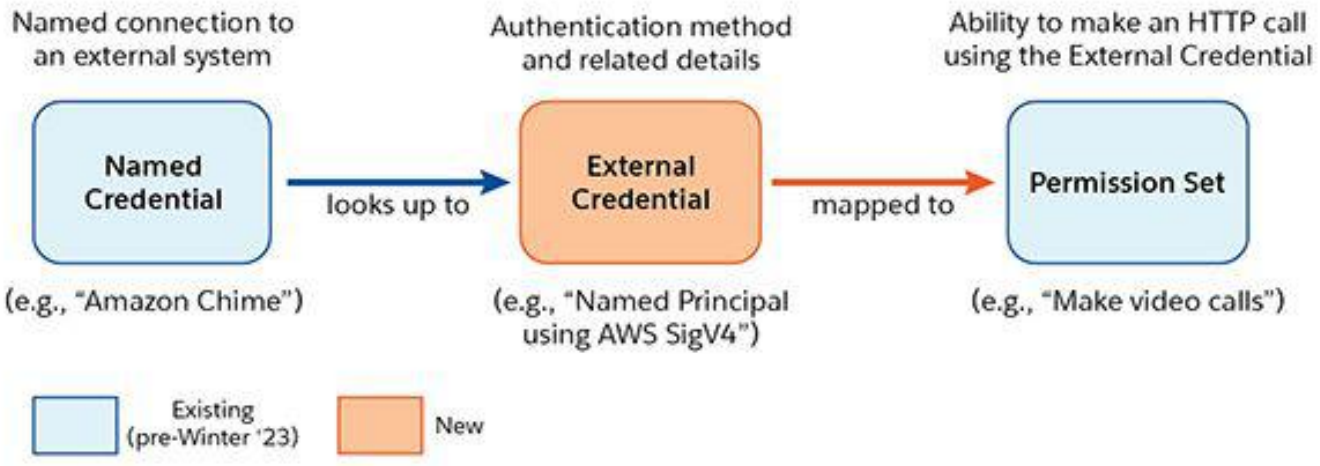
- Secure private access to your AWS environments

AWS PrivateLink

Coming in Winter ‘23 (SAFE HARBOR)

New architecture that supports:

- Custom name/value pairs for auth headers
- Per Permission Set assigned Credentials
- A new Lightning-native Setup UI



https://help.salesforce.com/s/articleView?id=release-notes.rn_security_other_custom_named_credentials.htm&type=5&release=240

Resources

Check Out Trailhead To Learn More!

- **Secure Secret Storage:**
  https://trailhead.salesforce.com/content/learn/modules/secure-secrets-storage
- **Apex REST Callouts:**
  https://trailhead.salesforce.com/modules/apex_integration_services/units/apex_integration_rest_callouts
- **APEX SOAP Callouts:**
  https://trailhead.salesforce.com/modules/apex_integration_services/units/apex_integration_soap_callouts
- **Data Integration Superbadge:**
  https://trailhead.salesforce.com/en/super_badges/superbadge_integration
- **Develop Secure Web Apps:**
  https://trailhead.salesforce.com/trails/security_developer

Groundswellers at Dreamforce

We're all wearing "G" pins so come say hello!

Savio Jose

Product Practice Manager

Presented: Best Practices for Data Security in Experience Cloud

Cameron Reid

Emerging Technologies Lead

Presented: Diagramming for the Admin

Leonardo Berardino

Principal Developer

Presented: Open-Source Mocking Framework Based on Apex Stub API

Gerauld Rivera

Marketing Cloud Product Lead

Colin Hamilton

Field Service Product Lead

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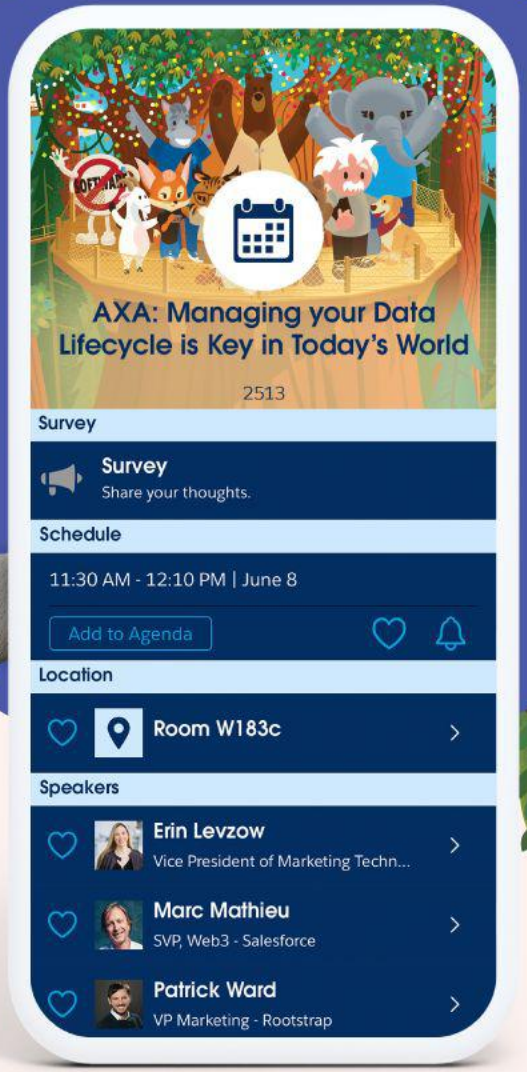

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Q&A

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Thank you