



Using Identity Caching

Cisco AR software includes the identity caching feature. Cisco AR runs as application layer software and can be used standalone or in conjunction with other workstations running Cisco AR.



Note

The identity caching feature is available on Cisco AR releases 3.5.2 and above.

Identity caching provides subscriber identity resolution services with fast access to associated subscriber identity data for service providers, enabling them to offer new services to their customers based on identity caching and context information management.

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Overview

Identity caching enables Cisco equipment to gain context information about the operator's subscribers to support network functions or to enhance subscriber's experience on the operator's network.

[Figure 12-1 on page 12-2](#), Cisco AR System Overview, shows the network environment where Cisco AR identity caching might be used.

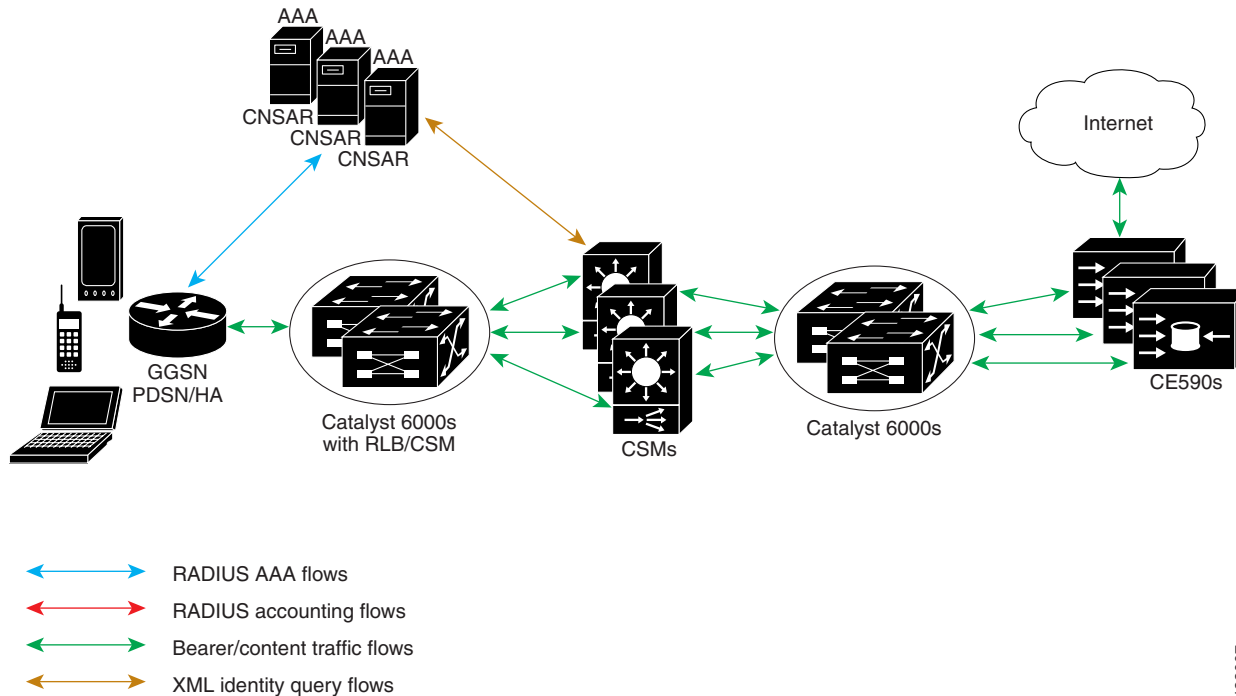
For example, Client Services Gateway (CSG) uses IP mapping information provided by identity caching to support post-paid content billing. Identity caching acquires subscriber information from other devices and information sources in the operator's network. The type of information provided is limited by the available information sources and is configurable by the operator, but might include information such as IP address, MSISDN, and IMSI. Identity caching does not duplicate the operator's persistent data stores. Identity caching provides a protocol-based interface through which Cisco network elements (Cisco AR identity caching clients) can access subscriber information.

The Cisco AR servers receive RADIUS flows from the Gateway GPRS support Node (GGSN) which acts as a type of network access station (NAS). These flows perform full AAA (authentication, authorization and accounting). You can configure the Cisco AR servers to redirect the accounting information (only) to an identity caching server to be cached. The GGSN can also be configured to direct only the RADIUS accounting information directly to the Cisco AR server.

Cisco AR also receives XML identity query flows from the CSM which acts as a NAS. In the event that a CSM should fail or lose its information, the information can be refreshed from the information cached in the Cisco AR server.

Cisco AR acquires subscriber information such as the IP address, the mobile Subscriber ISDN number (MSISDN), and the International Mobile System Identifier (IMSI) from AAA requests the Cisco AR server receives, typically from the GGSN. The types of information provided is limited by the available information sources and is configurable by the operator.

Figure 12-1 Cisco AR System Overview



Identity Caching Features

Cisco AR identity caching provides the following features:

- Supports GGSN subscriber data attributes from RADIUS authentication sequences
- Provides basic identity mapping services from IP address or username/APN to Mobile DN for one network presence at a time.
- Provide session management support for Content Switch Module (CSM)

Cisco AR enables the CSM to keep the data session and content correlated to the same subscriber reconnecting, perhaps after an attach/detach sequence for a GPRS subscriber connecting again. This is done through the MSISDN identity to IP mapping in the identity caching function.

- Enhance redundancy with stateful fail-over support for applications by finding the right connection between subscriber identity and IP address using the Identity Cache function

- Uses an XML interface to make it easier for any network function or application to use without having to have detailed internal knowledge about the execution environment or programming methods.
- Provides user identity resolution with fast access to associated subscriber data
- Establishes an identity and Access Management solution that can be used in and across multiple network domains
- Provides a way to use identity resolution to manage the growth of 2.5G mobile data access services (GSM/GPRS) and to provide always-on mobile data access including the following:
 - Ties various IP addresses to a unique subscriber identifier
 - Dynamically assigning and reusing IP addresses and controlling services with consistent identification
 - Correlates previous content activity when a mobile subscriber reconnects
 - Correlates IP addresses, mobile numbers, user name, and identifiers to support customer billing
 - Correlates and identifies subscribers using both 2.5G and WLAN services and provides a way to control and manage operator network services
 - Provides subscriber privacy control
 - Provides a way to cache content with various customers and their networks

Configuring Cisco AR for Identity Caching

Use the command line interface **aregcmd** to configure Cisco Access Registrar 3.5 to perform identity caching.

Step 1 Start **aregcmd**.

Step 2 Define a client object for each client that will send either RADIUS or XML packets to the Cisco AR server performing identity caching. There should be one client object for each GGSN, one for each CSM and one for each packet simulator (if used in a test environment).

For example, if a packet simulator will be used on the same server where you perform identity caching, add a client object as in the following:

```
cd /Radius/Clients
```

```
add xml-client
```

```
cd xml-client
```

```
[ //localhost/Radius/Clients/xml-client ]  
Name = xml-client  
Description =  
IPAddress =  
SharedSecret =  
Type = NAS  
Vendor =  
IncomingScript~ =  
OutgoingScript~ =  
EnablePOD = FALSE
```

This client object is very similar to the localhost object defined in the example configuration. The **SharedSecret** property will be ignored if the client is an XML client, but still must be set to a non-null value. The **Type** property is also ignored for XML clients.

Step 3 Define a port object for each RADIUS port and each XML port to be used.

Two RADIUS ports, the second immediately following the first in numeric value, must be defined even if only one is needed. A typical identity caching installation requires the following port configuration:

```
cd /Radius/Advanced/Ports
add 1645
add 1646
add 8080
```



Note Although ports 1645 and 1646 are the default ports for Cisco AR, you must add them to **/Radius/Advanced/Ports** to also add port 8080.

Step 4 Change directory to the 1645 port and set its type to Radius-Access.

```
cd /Radius/Advanced/Ports/1645
set Type Radius-Access
```

Step 5 Change directory to the 1646 port and set its type to Radius-Accounting.

```
cd /Radius/Advanced/Ports/1646
set Type Radius-Accounting
```

Step 6 Change directory to the 8080 port and set its type to XML.

```
cd /Radius/Advanced/Ports/8080
set Type XML
```

Step 7 Define and configure an accounting service of type file and set it as the DefaultAccountingService.

An accounting service is required for Cisco AR to cache identity information, even if no accounting service is needed otherwise. If you added the example configuration during installation, a local-file accounting service is already configured. If you did not add the example configuration during software installation, refer to [“Setting Up Accounting” section on page 7-1](#).

Step 8 Define and configure a ResourceManager for identity caching.

```
cd /Radius/ResourceManagers
add cache
```

Step 9 Set the ResourceManager to type session-cache for identity caching.

```
cd cache
set type session-cache
```

The following shows the default properties of a session-cache ResourceManager:

```
[ //localhost/Radius/ResourceManagers/cache ]
Name = cache
Description =
Type = session-cache
OverwriteAttributes = FALSE
QueryKey =
PendingRemovalDelay = 10
AttributesToBeCached/
QueryMappings/
```

Step 10 Set the QueryKey to a RADIUS attribute you want to key on.

For example, use the following command to set the QueryKey to Framed-IP-Address:

```
set QueryKey Framed-IP-Address
```

The QueryKey must match the string on the right-hand side of one of the pairs you list in QueryMappings. It is not necessary for the QueryKey to be configured under attributesToBeCached because the QueryKey will always be cached by default.



Note The QueryKey property must always be a RADIUS attribute.

Step 11 Change directory to **AttributesToBeCached** and use the **set** command to provide a list of RADIUS attributes you want to store in cache.

```
cd AttributesToBeCached
```

```
set 1Calling-Station-ID
```

```
Set 1 Calling-Station-ID
```

```
set 2 User-Name
```

```
Set 2 User-Name
```

The attributes a session-cache resource manager caches can be queried through both RADIUS Query and XML Query packets. When you cache attributes Framed-IP-Address or User-Name, or when you use XML-Address-format-IPv4 or XML-UserId-id_type-subscriber_id as the QueryKey, you must map the XML attributes to RADIUS attributes in the QueryMappings subdirectory.

Step 12 Change directory to **QueryMappings** and use the **set** command to list the attribute pairs, mapping the XML attributes on the left-hand side to the RADIUS attribute on the right-hand side.

```
set XML-Address-format-IPv4 Framed-IP-Address
```

```
Set XML-Address-format-IPv4 Framed-IP-Address
```

```
set XML-UserId-id_type-subscriber_id User-Name
```

```
Set XML-UserId-id_type-subscriber_id User-Name
```

Step 13 Change directory to **/Radius/SessionManagers** and add a SessionManager for identity caching.

```
cd /Radius/SessionManagers
```

add IDcache

Step 14 Change directory to the new identity caching SessionManager, then change directory to the ResourceManager list.

cd IDcache/ResourceManagers

Step 15 Use the **set** command to associate the identity caching ResourceManager with this SessionManager.

set 1 cache

Step 16 Change directory to **/Radius** and set the DefaultSessionManager to the identity caching SessionManager.

cd /Radius**set DefaultSessionManager IDcache**

Step 17 Run the **save**, **reload**, and **exit** commands:

save**reload****exit**

Starting Identity Caching

To start identity caching, you must send an Accounting-Request to the specified accounting port (default 1646). A minimal Accounting-Request will contain the following attributes:

```
NAS-Identifier or NAS-IP-Address
NAS-Port
Framed-IP-Address
User-Name
Acct-Status-Type
Acct-Session-Id
```

Step 1 Launch **radclient**:

cd /opt/CSCOar/bin**radclient -C localhost -N admin -P aicuser**

Step 2 From within **radclient**, run the following commands:

set p [acct_request Start joeuser@cisco.com]**\$p set attrib [attrib Framed-IP-Address 123.123.123.123]****\$p send**

This assumes that **radclient** is running on the same server and that 1646 is the accounting port.

- Step 3** Send XML requests to the specified XML port (no default, but 8080 is suggested above). A typical XML packet will look like the following:

```
<?xml version="1.0"?>
<Request>
  <UserIdRequest>
    <Address format="IPv4">123.123.123.123</Address>
  </UserIdRequest>
</Request>
```

To do this using **xmlclient**, put the XML text into a file, then use the following command:

```
cd /opt/CSCOar/bin

./xmlclient -srd <file>
```

**Note**

This assumes that **xmlclient** is running on the same server as identity caching and that 8080 is the XML port. Use the command **xmlclient -H** for information about how to use a different port or run it from a different server.

- Step 4** If you ran both of the above command sequences sending the above Accounting-Request using **radclient**, then sending the above XML request using **xmlclient**, the response will appear on **stdout**. You can also see how the Cisco AR server responds and get a lot of detailed information on how it operates internally by turning on tracing. You turn on tracing by running the following command:

```
trace /Radius <X>
```

where **<X>** is any integer from 0 to 5. A setting of **0** means turn tracing off. Setting tracing to **1** provides a little detail, and each higher number (up to 5) provides more detail than the previous. This command can also be run directly from the shell prompt as follows:

```
cd /opt/CSCOar/bin

./aregcmd -C localhost -N admin -P aicuser trace /Radius 1
```

- Step 5** Use the **aregcmd** command **release-sessions** to remove cache entries. For example, to empty the entire cache, enter the following commands:

```
cd /opt/CSCOar/bin

./aregcmd -C localhost -N admin -P aicuser release-sessions /Radius all
```

XML Interface

The XML interface is used for subscriber context information queries and responses to those queries. The XML interface is on a UDP port (8080) and is configurable. Identity caching supports the XML data-type definition (DTD) supported by the CSG.

The mapping from queries to replies may be one to many. For example, a UDP datagram might contain several queries but each reply will be returned in a separate datagram. No single query or reply may exceed the configured MTU of a datagram. Any that does results in an error.

If a query result is negative, the reply will consist of a null subscriber ID. All other error conditions cause Cisco AR to drop the request. Errors are logged locally using the Cisco AR logging mechanism.