BIRKENHEAD SIXTH·FORM·COLLEGE

High Quality Education For All

Computer Services Documentation

Shibboleth Documentation

{Shibboleth & Google Apps Integration}

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Introduction

This document provides information intended to help those installing and configuring Shibboleth to work with Google Apps (Education Edition). It assumes that you are using Microsoft Active Directory as an authentication method for your users.

There are six parts to getting Google Apps to work correctly with Shibboleth:

1) DNS/FQDN Configuration
2) Initial Sign Up to Google Apps
3) Configuration of Google Apps (pre-Shibboleth)
4) Setting up Active Directory Synchronisation
5) Setting Up Shibboleth
6) Altering Google Apps to use Shibboleth as an authentication method

Part 1 – DNS/FQDN Configuration

For the purposes of this document we are going to set up a new fully qualified domain name (FQDN) of 'shibmail.bsfc.ac.uk'.

Step A – Register DNS Entries

Register your new FQDN by adding the following DNS information for your required DNS entry (again in this example we are using shibmail.bsfc.ac.uk):

Registering all the information below at once will save you having to carry out other steps later on.

shibmail	IN	MX	10	aspmx.l.google.com
	IN	MX	20	alt1.aspmx.l.google.com
	IN	MX	20	alt2.aspmx.l.google.com
	IN	MX	30	aspmx2.googlemail.com
	IN	MX	30	aspmx3.googlemail.com
	IN	MX	30	aspmx4.googlemail.com
	IN	MX	30	aspmx5.googlemail.com
$ORIGIN shibmail.bsfc.ac.uk				
googlefffffffff9489253a	IN	CNAME	google.com	
mail	IN	CNAME	ghs.google.com	

This will normally take 24 hours to become effective.

Part 2 – Initial Sign Up to Google Apps

Navigate to the Google Apps signup page:

http://www.google.com/a/cpanel/education/new

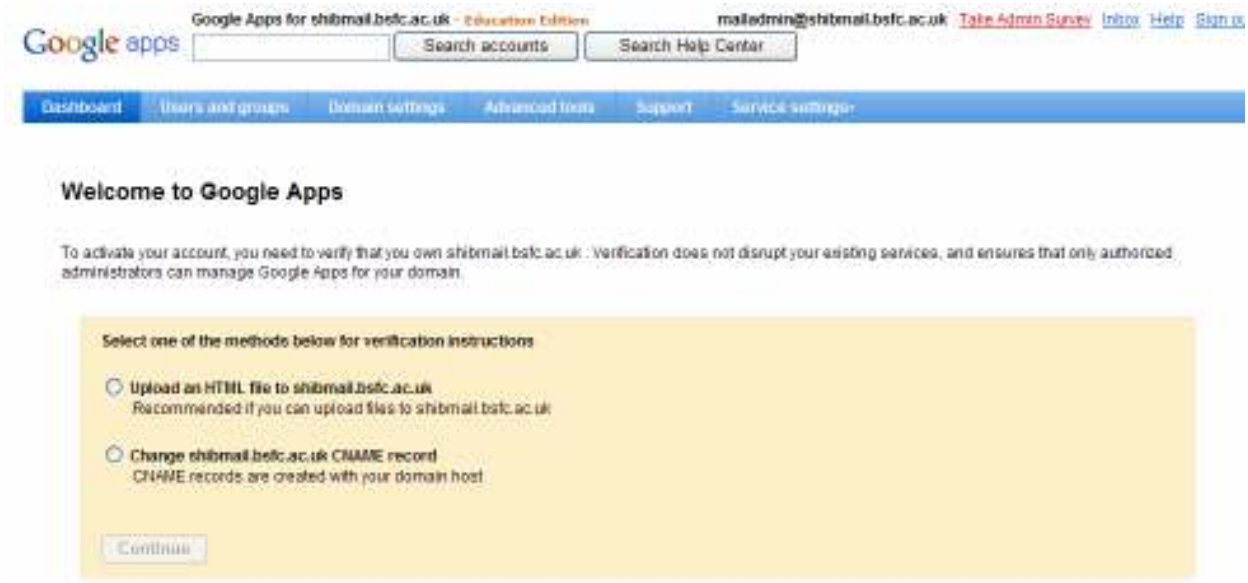
Enter your domain name *shibmail.bsfc.ac.uk*

On the next screen ("Sign up for Google Apps Education Edition – Step 2 of 3"), complete the information on the page and click next.

On the next screen (“Sign up for Google Apps Education Edition – Step 3 of 3”), create an administrator account with an associated password – this will be used to administer GoogleApps:

Username *mailadmin*

You will then be passed over to the “Welcome to Google Apps” page:



Select “Change shibmail.bsfc.ac.uk CNAME record” and click “Continue”.

At the next screen (“Change CNAME records to verify that you own shibmail.bsfc.ac.uk”), click “I’ve completed the steps above”:

If your DNS has not propagated, you will need to wait 24 hours before you continue.

After your DNS has propagated, log back into the site via the link:

https://www.google.com/a/shibmail.bsfc.ac.uk/

Log in as Administrator (in our case mailadmin), and return to “Verify the domain ownership”.

Part 3 – Configuration of Google Apps (pre-Shibboleth)

In our system we want to be able to use our FQDN rather than Google's built-in one (http://mail.google.com/a/shibmail.bsfc.ac.uk), so we are going to alter the settings to point at mail.shibmail.bsfc.ac.uk.

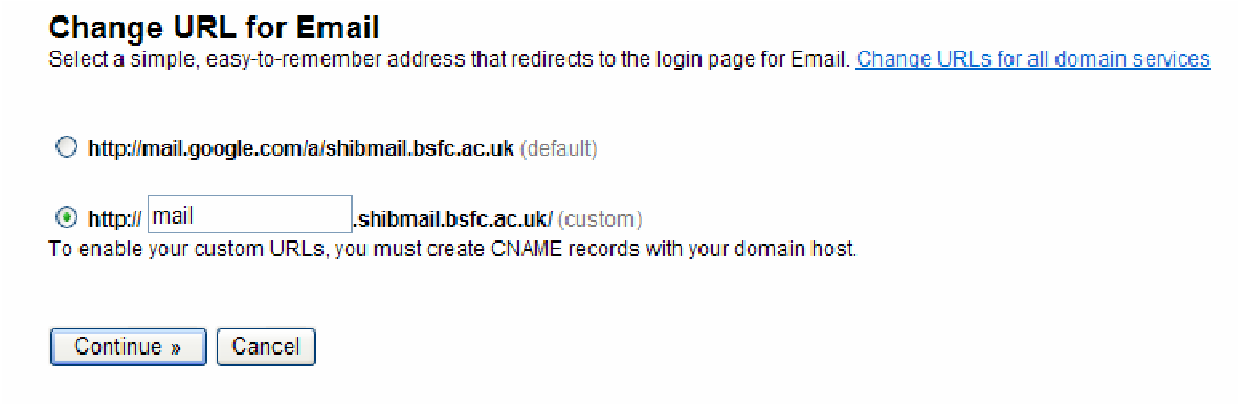
GoogleMail

Goto "Service Settings" on the main menu and select "Email".

There are various options that can be set here, but for the purposes of this document I am only going to set the most relevant.

Under "Web address", click "Change URL" and select the 2nd option. As you can see from the screenshot, the default URL for e-mail will now be:

http://mail.shibmail.bsfc.ac.uk



Click on "Continue"; you will be presented with a "Changing CNAME record" page. As you have already completed this step you can click 'I've completed these steps'.

Return to the Email page ("Service Settings" → "Email") and near the bottom of the screen there is a section called "Email Activation". Click on the "Instructions on how to activate Email".

A new page will appear ("How to activate e-mail"). As we are going to use Active Directory to synchronise the users, we can ignore section 1.

In section 2 ("Set up email delivery"), click on the link "Change MX Records".

As you have already completed these steps, click on "I have completed these steps".

We also set the following options in the Email page (these may not be relevant for everyone):

Name Format	*We un-ticked "Allow users to customize this setting".*
Email white list	*We entered the external IP range of the institutional network.*

Part 4 – Setting up Active Directory Synchronisation

There are three steps to achieving this:

Step A – Setting Google Apps to use an external provisioning API.

Step B – Setting the 'new' e-mail address for all your users in Active Directory.

Step C – Setting up the synchronisation with Active Directory.

Step A – Google Apps – Enable Provisioning API

Log into Google Apps as the Administrator, click on ‘Users and groups’, and then click on ‘Settings’.

Put a tick in the box next to ‘Enable provisioning API’ and click ‘Save changes’ at the bottom of the page.

Step B – Setting the e-mail address in the Users’ Profile

In Active Directory you will need to set the “E-Mail” field with the users’ new e-mail address (as this is used as part of the synchronisation routine). I suggest you speak to your network team about this one (as I do both jobs, I didn’t think it was necessary to have a conversation with myself).

In our setup, we only have the Students configured to use Google Apps, so only the users inside our Active Directory OU (and subsequent sub-OUs) are synchronised to Google Apps:

OU=Students
2009 Entry
2008 Entry
2007 Entry
Adult Education

To do this quickly, select all of your users and put this into their e-mail fields:

%username%@shibmail.bsfc.ac.uk

This automatically sets the e-mail field for each as *username*@shibmail.bsfc.ac.uk

Step C – Setting up Active Directory Synchronisation

You need to install an application called “Google Apps Directory Sync” onto a server in your domain; we have it installed on the same server as our Shibboleth installation.

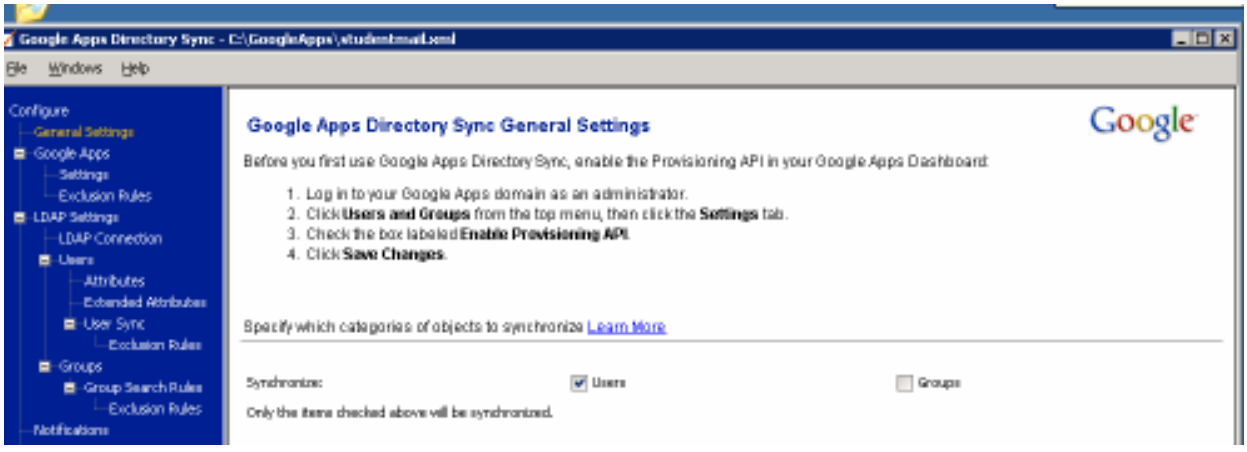
It can be downloaded from:

http://dl.google.com/dirsync/dirsync-win32.exe

A tutorial is available here:

http://www.postini.com/webdocs/training/en/DirSync_GoogleApps/DirSync_GoogleApps.html

Once the software is installed, run the config-manager to create and test the config file:



Below I list the left-hand sections, along with the settings that we used. We currently don't sync the AD Groups, so I have left this part out.

Note that the attributes released to Google Apps below include those described as "personal data". For the implications of doing this please refer to the UK federation document *Recommendations for Use of Personal Data*, accessible from http://www.ukfederation.org.uk/content/Documents/FedDocs.

General Settings

Synchronize	*Users*

Google Apps → Settings

Admin E-mail Address	*mailadmin@shibmail.bsfc.ac.uk*
Admin Password	*xxxxxxxx*
Domain Name	*shibmail.bsfc.ac.uk*

I also entered the address of our Microsoft ISA Server to allow connections out (HTTP proxy)

Google Apps → Exclusion Rules

Click "Add Rule"

Type	*USER_NAME*
Match Type	*EXACT*
Rule	*mailadmin*

Note: *This "mailadmin" account is the administrator account that we set up for Google Apps. If you don't specifically exclude it, then when you synchronise your users, it will get deleted because it does not exist on your AD structure.*

LDAP Settings → LDAP Connection

Connection Type	*Standard LDAP*
Hostname	*bsfcdomain.bsfc.ac.uk*
Port:	*389*
Base DN	*We only sync our "Students" OU* *OU=Students,DC=bsfcdomain,DC=bsfc,DC=ac,DC=uk*
Authentication Type	*Simple*
Authorised User	*xxxxxx@bsfcdomain.bsfc.ac.uk*
Password	*xxxxxxxx*

Note: *This is the same user as the one we use in Shibboleth; it is basically a read-only account allowed to do LDAP lookups.*

Users → Attributes

Server Type	*MS Active Directory*
Email Address Attribute	*mail*

Ensure that all of your student accounts have their Google Apps e-mail address specified in the 'E-Mail tab of their profile'.

Users → Extended Attributes

Given Name Attribute	*givenName*
Family Name Attribute	*sn*
Password Encryption	*SHA1*

Users → User Sync

Click 'Add Rule'

Scope	*Sub-tree*
Rule	*objectclass=perso*n

Notifications

Send notifications from	*csgoogle@bsfc.ac.uk*
SMTP Relay Host	
User Name	
Password	

We created an account for these notifications to be sent to our admin contact, so that one can see the status of the synchronisation.

Delete Limits

Do not synchronise if the delete limit would be exceeded:

Delete no more than: *60% of users*

Log Files

File name	*sync.log*
Log Level	*INFO*
Maximum Log Size	*1GB*

Once you have got to this stage, it is a good idea to save the configuration file. We saved our configuration files into a folder called "C:\GoogleApps" on our Shibboleth Server.

After you have saved the file, move into the **Test** section.

If you click on "Simulate Sync" the process will run based on your configuration file, but will not write anything out to Google Apps.

You should notice that the "Sync Log" will show:

Proposed Changes

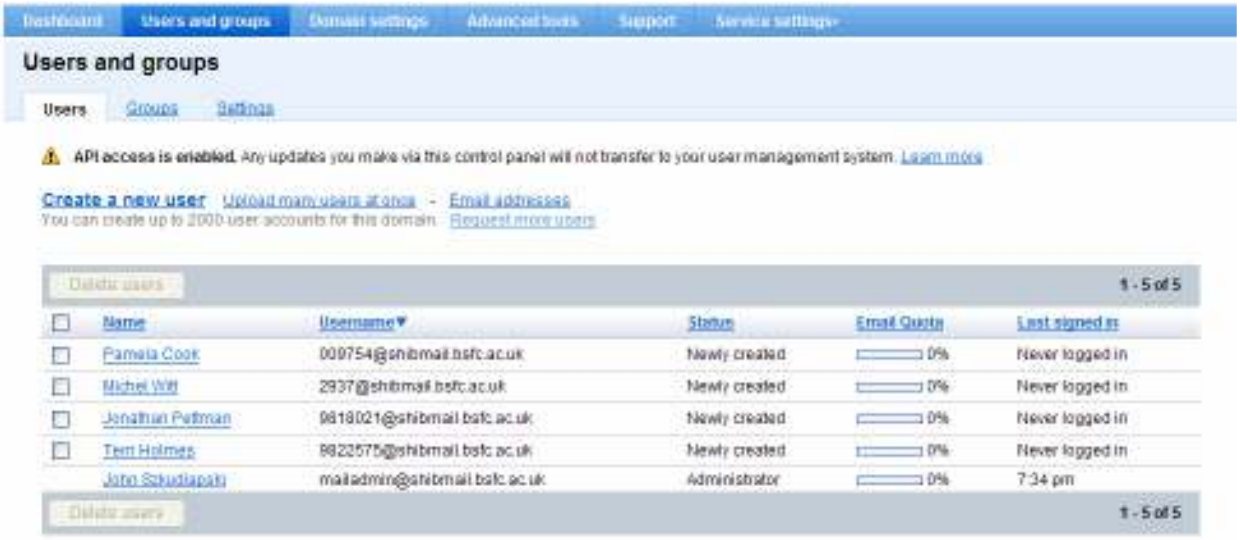
Delete:	0
Modify:	0
Create:	xxxx (number of users to create)

You now need to create a scheduled task that runs periodically to update Google Apps based on the changes within AD (user additions/deletions). We have ours set to run at 2am every day.

Create a new scheduled task

New Scheduled Task Name	*GoogleAppsSync*
Run	*"C:\Program Files\Google Apps Directory Sync\sync-cmd.exe" -a -c C:\GoogleApps\studentmail.xml*
Run As	*We have a dedicated account to run tasks*
Schedule	
Scheduled Task	*Weekly*
Start Time	*02:00*
Schedule Task Weekly	
Every	*1 weeks*
On	*Mon, Tue, Wed, Thu, Fri, Sun*

The next time this task runs, it will populate Google Apps with all of your students, as can be seen from the following screenshot:



Part 5 – Setting up Shibboleth

Google has a handy document on how to set up Google Apps with Shibboleth:

http://code.google.com/apis/apps/articles/shibboleth2.0.html

First we need to configure Google Apps to use Shibboleth; then we need to make some alterations to our Shibboleth installation.

Take a backup of the configuration files before you make any alterations.

Step A – Configure Google Apps to use Shibboleth

To set the SSO configuration you can navigate to the page from either of two locations:

Advanced Tools → Set up single sign-on (SSO)

or

Users and Groups → Settings → Set up single sign-on (SSO)

Below are the configuration options that we have set:

Enable Single Sign-on *Ticked*

Sign-in page URL

We direct the Sign-in page URL to be our Shibboleth IdP:

https://sso.bsfc.ac.uk/idp/profile/SAML2/Redirect/SSO

Sign-out page URL

At present we direct the users to a static HTML page whenever they sign out of Google Apps:

http://studentapps.bsfc.ac.uk/logoutmail.html

Change password URL

At present we have not implemented a web-based change password option for our Active Directory so we redirected this to a static HTML page:

http://studentapps.bsfc.ac.uk/logoutmail.html

Verification Certificate

Upload the 'idp.crt' certificate from your Shibboleth Install, e.g.:
C:\Shibboleth\Shib2\Shib2Idp\credentials\idp.crt

You may need to copy this temporarily to a publicly accessible location.

In this example I am using the 20 year self-signed certificate (idp.crt) to protect the 8443 port. However, if you are going to use another certificate (such as a Janet Certificate Service certificate) to protect the 8443 port, then you should specify it here instead.

Scroll down to the bottom of the page and click "Save Changes".

Step B – Change Shibboleth IdP Files

a) Create a new file called google-metadata.xml (located at %idp_home%/metadata/) and containing the following text:

```
<EntityDescriptor entityID="google.com"
xmlns="urn:oasis:names:tc:SAML:2.0:metadata">
    <SPSSODescriptor
protocolSupportEnumeration="urn:oasis:names:tc:SAML:2.0:protocol">
        <NameIDFormat>urn:oasis:names:tc:SAML:1.1:nameid-
format:unspecified</NameIDFormat>
        <AssertionConsumerService index="1"
Binding="urn:oasis:names:tc:SAML:2.0:bindings:HTTP-POST"
            Location="https://www.google.com/a/YOURDOMAIN.COM/acs" />
    </SPSSODescriptor>
</EntityDescriptor>
```

Change **YOURDOMAIN.COM** to reflect your domain; in our case this would read:

```
Location="https://www.google.com/a/shibmail.bsfc.ac.uk/acs" />
```

b) Then edit the file %idp_home%/conf/relying-party.xml and add the following code just after the `DefaultRelyingParty` element:

```
<RelyingParty id="google.com"
        provider="YOUR-ENTITY-ID"
        defaultSigningCredentialRef="IdPCredential">
    <ProfileConfiguration xsi:type="saml:SAML2SSOProfile"
encryptAssertions="never" encryptNameIds="never" />
</RelyingParty>
```

Note that the certificate specified via `IdPCredential` in your relying-party.xml configuration file must match the “Verification certificate” specified in Step A above.

Change **YOUR-ENTITY-ID** to reflect your IdP name; in our case this would read:

```
provider="https://sso.bsfc.ac.uk/idp/shibboleth"
```

c) Still in the file %idp_home%/conf/relaying-party.xml, add the following code:

```
<!-- Google Metadata -->
<MetadataProvider id="GoogleMD" xsi:type="FilesystemMetadataProvider"
xmlns="urn:mace:shibboleth:2.0:metadata"
    metadataFile="IDP_HOME/metadata/google-metadata.xml"
maintainExpiredMetadata="true" />
```

Change IDP_HOME/ to reflect the location of your Shibboleth Installation; in our case this would read:

```
metadataFile="C:\Shibboleth\Shib2\Shib2Idp/metadata/google-metadata.xml"
```

d) Edit the file %idp_home%/conf/attribute-resolver.xml and add the following code:

```
<resolver:AttributeDefinition id="principal" xsi:type="PrincipalName"
xmlns="urn:mace:shibboleth:2.0:resolver:ad">
    <resolver:AttributeEncoder xsi:type="SAML2StringNameID"
xmlns="urn:mace:shibboleth:2.0:attribute:encoder"
        nameFormat="urn:oasis:names:tc:SAML:1.1:nameid-
format:unspecified" />
</resolver:AttributeDefinition>
```

e) Finally, edit the file %idp_home%/conf/attribute-filter.xml and add the following code:

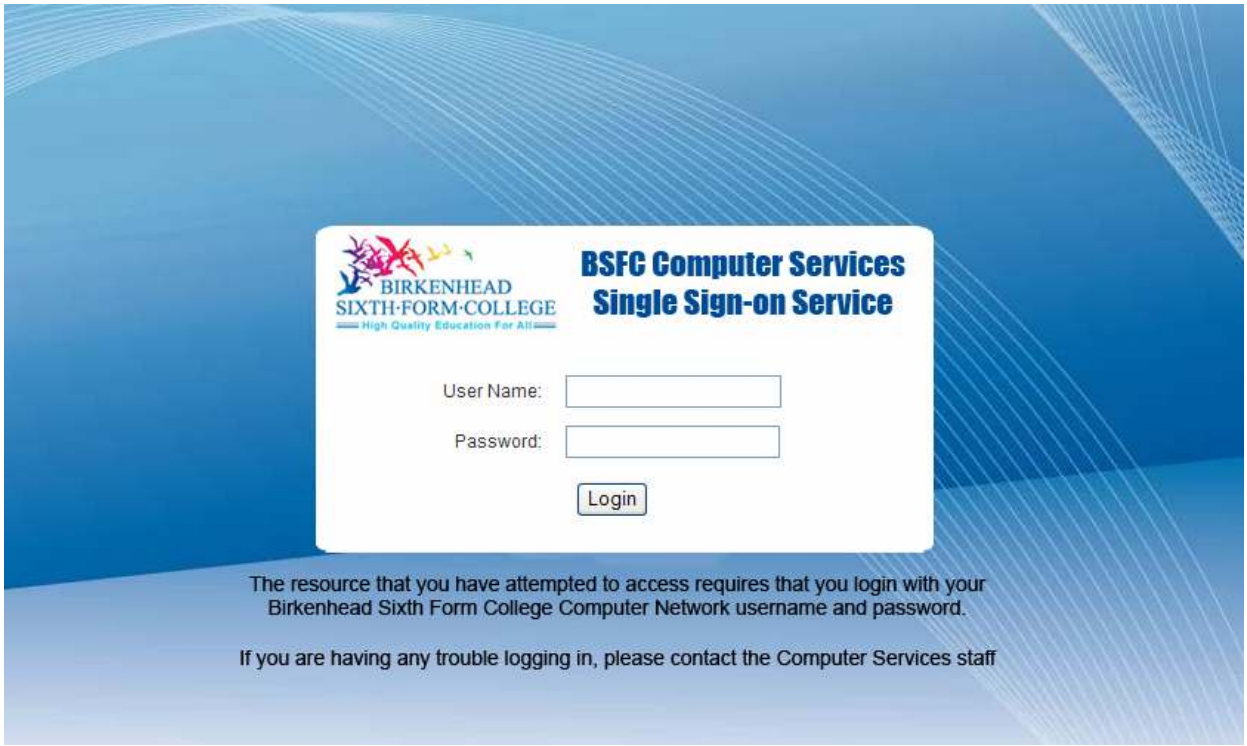
```
<AttributeFilterPolicy>
    <PolicyRequirementRule xsi:type="basic:AttributeRequesterString"
value="google.com" />
    <AttributeRule attributeID="principal">
        <PermitValueRule xsi:type="basic:ANY" />
    </AttributeRule>
</AttributeFilterPolicy>
```

You need to restart Tomcat for these settings to become effective.

If you now access your Google Apps install via

mail.shibmail.bsfc.ac.uk

You will automatically be directed to your Shibboleth IdP login screen:



If you now log in as a user, you will automatically be redirected to your Google Apps mail page:

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