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Govroam CAT: purpose and scope

Govroam CAT Signup

Background

The CAT (Configuration Assistant Tool) allows end users to install a configuration on their devices which will allow to them easily connect to Govroam. These are primarily intended to help BYOD (Bring Your Own Device) users, as opposed to corporately managed devices.

Structure

Each organisation (e.g. Holby Trust) will have an entry (an Identity Provider) in the CAT which can be managed by one or more members of that organisation, normally the person, or people, who manage the RADIUS proxy system. These administrators can add, or remove, other administrators of their Identity Provider. Within each Identity Provider there can be multiple profiles, with independent configuration, which allows for different realms, authentication types, support details and other aspects.

Sign-Up

Initially each site should request a token for an administrator. That token will be sent to the supplied email address and will be valid for **24** hours. After that time another token would have to be requested. On receipt of the token the recipient would click a link which takes them to the Login page. This Login page gives a number of options for Identity Providers (these are not the same Identity Provides as referred to above, but login systems for Google, LinkedIn, Twitter and a number of Universites). The administrator will need to pick one of these and log in. At this point the ID provided by the Login system, e.g. Google, will be permanently associated with the CAT. This means that in future the administrator will have to use the same Login system each time to gain access to the CAT. However, it is possible to change Login system1. Once logged in the administrator will have access to their CAT Identity Provider and be able to start the process of populating the appropriate values and creating a new Profile.

Summary

```
# The technical contact for your site should email govroam@jisc.ac.uk asking
for a CAT token.
# On receipt of the email from Jisc the technical contact should click on
the link (within 24 hours).
# Pick an IdP to use for now and in the future (e.g. Google).
# Log in with your Google credentials.
```

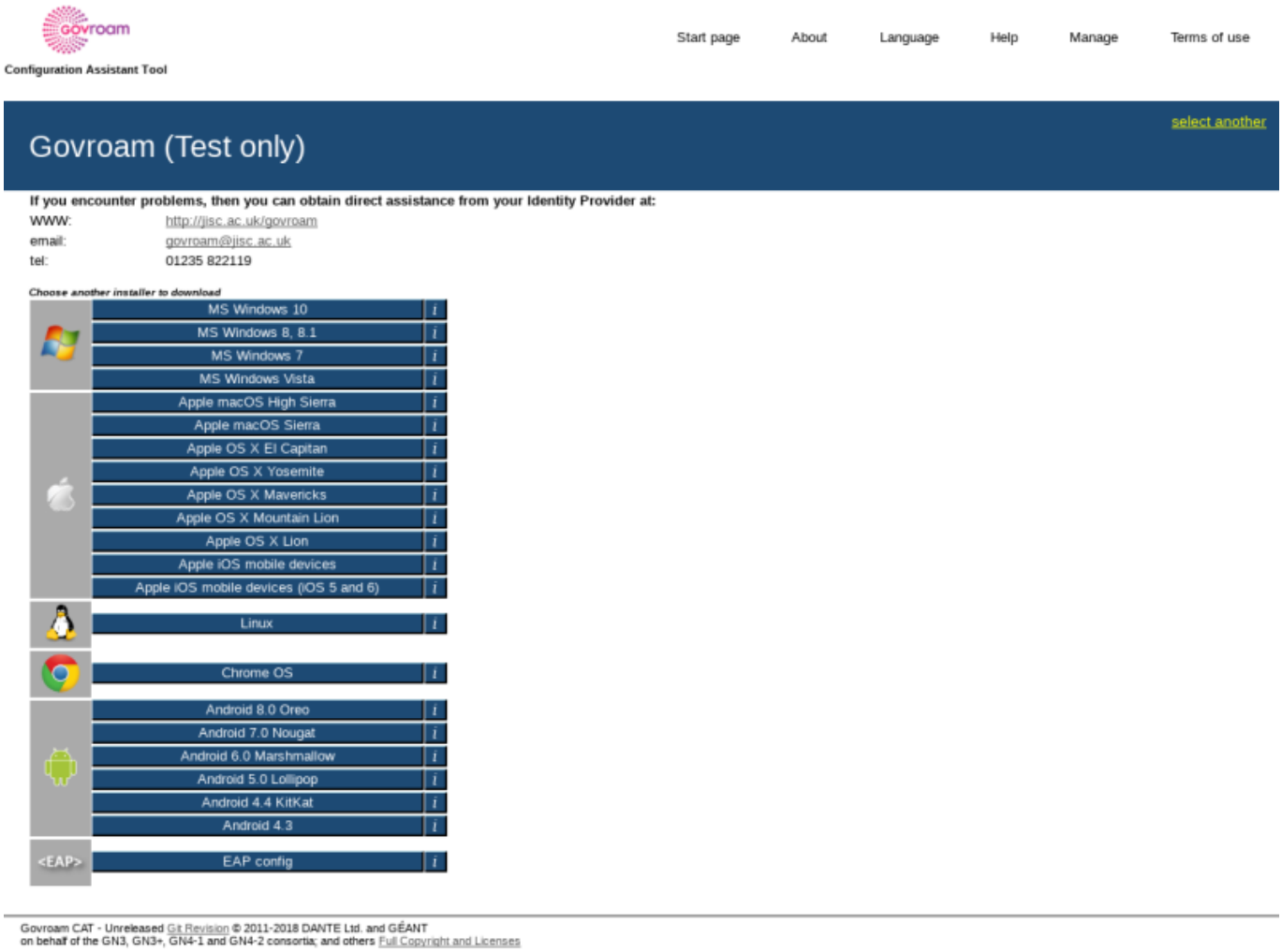
```
# Create a new CAT IdP for your site.
```

Introduction

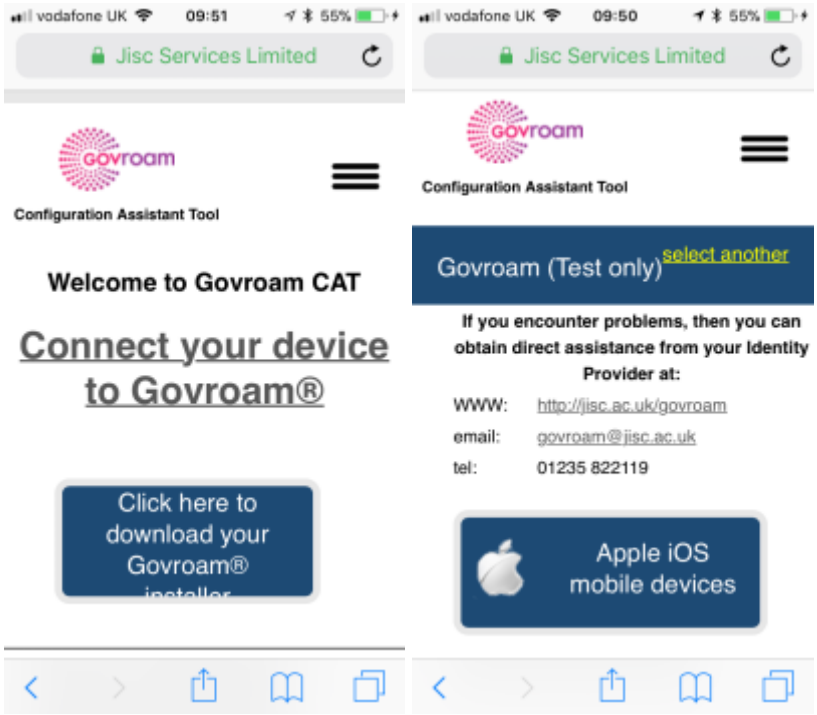
Govroam CAT is the Govroam Configuration Assistant Tool. Its purpose is to support you, an Govroam Identity Provider administrator, by allowing you to generate customised Govroam installers for various platforms. The customisation includes your IdP's name, location and logo, contact details for your helpdesk, and of course the RADIUS settings which users need to uniquely identify your IdP when roaming. The installers can be produced in many languages; that way, you can even offer your users an installer in their native language! Further to that, Govroam CAT can also assist you in debugging your own RADIUS setup by comparing your inputs to the actual behaviour of your setup in the Govroam infrastructure.

Govroam CAT can make the end-user installers available on its own user download area, or you may choose to download them yourself and distribute them on your organisation's own web page. You can also choose to make only a subset of the supported platforms available for direct download, while redirecting users of select platforms to your own support page (e.g. if you have custom installers with non-standard specialities for these platforms).

Surprisingly many users do not have a clue which operating system they are using. Govroam CAT thus includes an operating system detection and automatically suggests the fitting download. There is a “All platforms” link which takes users to the full platform selection if they so wish. A screenshot of the download area is below. Try it out yourself: hop over to https://cat.govroam.uk, and select any organisation on the download page!



There is also a lightweight download page for resource-contrained mobile devices. It also includes the operating system detection.



Device Support

Govroam CAT supports a broad selection of common end-user client devices and many EAP types.To view the full compatibility matrix of supported EAP types and devices, please visit the frontpage of Govroam CAT and click on “About Govroam CAT” on the left-hand side under the “About” menu. You will see that not all EAP types are supported on all platforms - we largely rely on the target Operating System's capabilities.

For some devices, there is little we can do, since they either do not support proper automatic configuration, or for various reasons such support cannot be used by CAT. For some select devices in that class we still offer the possibility for administrators to set a redirect target for this device. Administrators can then create a dedicated support web page to which the user will be sent for local instructions. You can find the list of these devices on the “Installer Fine-Tuning” page (see below); more devices can be added by the Govroam CAT operators; if you see a need for that please contact govroam@jisc.ac.uk.

Notably, Android versions below 4.3 are not supported and likely never will be, sorry. Your helpdesk will have to take care of legacy Android users by other means.

Support Policy for operating systems versions

Govroam CAT generally tries to follow vendors' end of life dates:

- Microsoft products:https://support.microsoft.com/en-gb/help/13853/windows-lifecycle-fact-sheet
- Apple products: https://support.apple.com/en-gb/HT201624

TTLS Support for Windows XP, Vista, and 7

GÉANT and SecureW2 are happy to announce that they have reached amicable settlement of their dispute relating to the distribution of EAP Suite 1.1.3 in the Govroam CAT platform.

Scope

Govroam CAT is not replacing your helpdesk! While we hope to do you a good service by taking the technical task of generating secure installers for many platforms into our hands, we can not take your users' phone calls or tell them how to fix problems on their computers. The CAT's installers work on the target platforms if these have not been modified beyond reason by the end-user, and we hope the installation process with them is intuitive enough; but we can not give you guarantees that you will not ever hear from failing users again.

Enrolling my organisation for Govroam CAT

Step 1: Requesting an entry for your organisation

Govroam CAT follows the usual organisational model of Govroam: your national federation administrator has control over all the Identity Providers in his country. To manage your organisation with Govroam CAT, please let your national administrator know that you want to participate using your usual communications channels.

If he finds you eligible for the service, he will send you an invitation email with a token (the token is valid for 24 hours after sending it to you). You can then follow the supplied link with the token, log into the Govroam Administration interface, and start managing your organisation - see the next section for details of organisation and profile setup.

Step 2: How to log into Govroam CAT?

When clicking on the Administration interface link, you will be automatically sent to the Govroam Support Services' federated login service. This login service does not work with site-specific usernames and passwords; instead you are presented with a list of sources of identity. Choose any organisation that you have an account with:

- Social Networks: You can log in using the federated login function of several popular social networks, including, but not limited to, Google and Facebook.
- UK Access Federation: many universities across Europe have already joined the educational Global Authorisation INfrastructure - if your organisation is among them, click on that organisation and authenticate with your home organisation's usual web login credentials.

Some users have noted that none of the above options suits them: e.g. their organisation is not participating in eduGAIN, and they have an aversion against using social networks. We understand that if a user finds all the numerous authentication options unacceptable, then he will have a hard time logging in. It might be worth considering creating a social network account just for the purpose of logging in here; even if the service portfolio offered by e.g. Google is not interesting for the user, their authentication service in itself is useful on its own. Alternatively, under the 'UK Access Federation' tab you can search for 'UnitedID'. https://unitedid.org/ provides free, secure accounts. This is a sort of 'home for the homeless' if the above options aren't suitable.

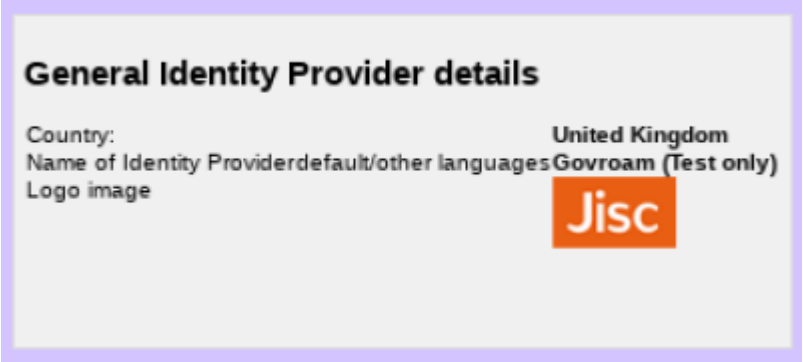
Whichever IdP you use to sign in is the one you need to keep using. Swapping to using another (say if you've got both Google and Facebook accounts) won't work as the CAT will be tied to the identity provided by the IdP you initially used. If you want to swap to using another IdP then send yourself an invite to manage your Organisation and then sign in with the new IdP. You can either keep the other account as an administrator or delete it.

Configuring my organisation's properties

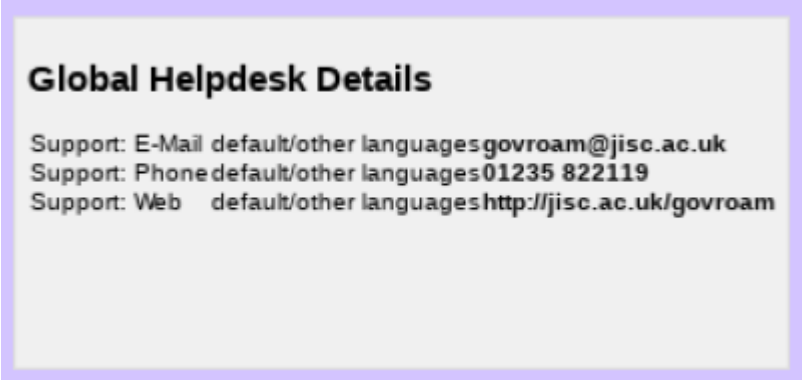
Overview

There are basically four groups of information which we need to ask of you before we can create good-looking installers for you:

- general information about your organisation (e.g. logo, approximate location, name)



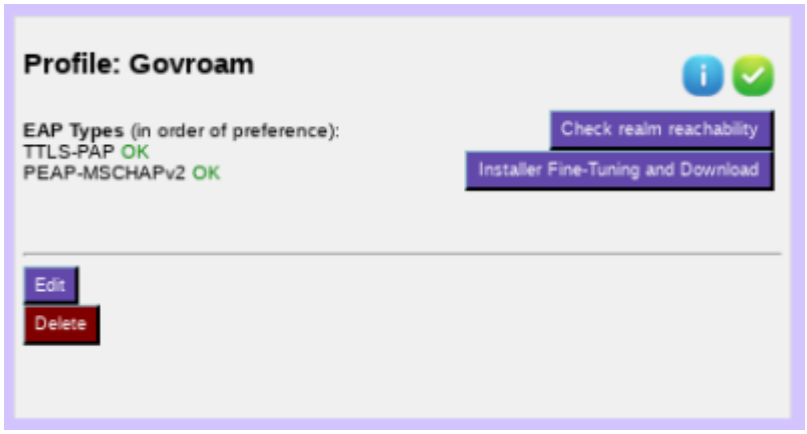
- helpdesk contact details (mail, phone, web)



- media properties (e.g. SSIDs, wired support)



- RADIUS and EAP details



To the largest extent possible, all the information is optional. If you choose not to let us know all the details we will still create installers, but they just won't contain as much information as they could. Please consider giving us as much information as possible. There are two governing principles regarding input and storage of information in the administrator user interface:

1. Textual information can be provided in many languages; one language representation should be set as the default language though - to have a string to present to users who want to use a language which wasn't explicitly configured.
2. An organisation consists of one of more EAP profiles, each of which can have its own EAP-specific settings. One typical use-case is an organisation which has “Doctor” and “Med Student” accounts with different EAP-Types being supported. Many options in Govroam CAT can either be set for the entire organisation or only for a specific profile; if a setting is set on both levels, the more specific profile-level setting will override the organisation-level one.

Organisation-wide Settings

After you've followed the invitation token from your national administrator, you'll be dropped right in the “Edit IdP” page. On that first time, you'll see a “wizard mode” which provides lots of explanatory text about the meaning of all the settings you can make. You can add and delete any of those options; don't be shy and try them all out! Adding a new option is done by pushing the corresponding button, selecting which option you want to set, and then the content of that new option. Changes will only be saved when you hit the “Continue …” button on the bottom of the page.





When you re-visit the “Edit IdP” page later from the Organisation Overview page, the explanatory texts are condensed in order not to overload the user interface. You'll certainly find your way around without the wizard texts.

You can configure three of the four areas mentioned above in this first page. The RADIUS and EAP settings are configured in the more specific Profile configuration at a later stage.

General Information

Helpdesk Contact Details

Media Properties

Here, you can now configure all media properties of your Govroam setup.

The SSID “govroam” for WPA2/AES is always configured as it is the core of the Govroam specification; you do not need to enter this one here. The list of things you can additionally configure in “Media” are:

- additional SSID for WPA2/AES:

If you deploy other SSIDs for which Govroam credentials are valid, you can add these here and they will be configured alongside the govroam SSID.

- additional SSID for WPA2/AES and WPA/TKIP

If you deploy other SSIDs for which Govroam credentials are valid, you can add these here and they will be configured alongside the Govroam SSID. This SSID will be installed for both WPA2/AES and (legacy) WPA/TKIP.

- additional own Hotspot 2.0 / Passpoint Consortium OI

If you want to enable Passpoint and have a Consortium Organisation Identifier, you can enter it here. **Currently there isn't an COI for Govroam but it is something being considered for the future** On end-user device side, settings made regarding Passpoint are supported by all the major OSes: Windows, Android, iOS and MacOS but at varying levels of competence.

- whether or not to configure wired ethernet for IEEE 802.1X

Some Govroam participants also use IEEE 802.1X for wired ethernet ports in their premises, e.g. in dormitories. Administrators can specify that the installers should include wired ethernet Govroam configuration on the client devices. This is currently supported for the Windows installers and Apple OS X. Windows installers will provoke a UAC prompt when wired support is turned on.

- disable captive portal SSIDs after setting up Govroam

Many Govroam participants deploy several SSIDs; typically, a captive portal SSID for help and/or download of configuration profiles/configuration instructions (a “bootstrap” or “onboarding” network), and the real Govroam network. If your users have connected to the bootstrap network before, their devices usually remember it, and may unfortunately prefer that network over the then-configured Govroam network. To prevent this, you can configure the name of your bootstrap SSID, and then during the installation process, CAT will either remove it from the client device, or at least mark it as “do not join automatically”.

Profiles

Profiles are the specific EAP configurations for your user group(s), and installers are always generated for specific profiles. If you only have one user group, the distinction between organisation-wide and

profile-wide settings does not make a difference. However, many IdPs have different user groups which share some properties, but not all. One example is where on the one hand Med Students have username/password accounts, authenticating with PEAP and generic helpdesk contact points, and on the other hand permanent staff have TLS Client certificates with EAP-TLS and access to a better second-level helpdesk just for them.

Govroam CAT makes it easy to manage multiple user group profiles for one organisation. Shared properties for e.g. server certificates and helpdesk contacts can be defined organisation-wide (which makes them immediately available in all profiles) or per-profile (the property then is only defined for this specific profile). You can also define organisation-wide settings and override them in specific profiles.

In the first-time wizard, the CAT automatically takes you to the profile creation page as soon as the organisation-wide settings are submitted.

For a profile, you first have to set its name and description, which as usually can be done in many languages. There is also one important option: “Production-Ready”. We will not publish your generated installers on the end-user download page unless you set this option and check the box. This is to prevent that people accidently download installers with incomplete information while you are still working on the final setup.

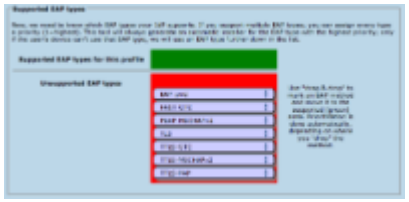


The CAT also asks for the RADIUS realm belonging to this profile; submitting the realm name is optional, but highly recommended because it enables us to do very thorough sanity checks on your RADIUS installation later. Please see the section “Verifying my RADIUS setup” for more details. You can also decide whether you want the generated installers to be configured with an anonymous outer identity, and what that identity should be. If you want users of that profile NOT to be given an installer, you can also specify that we should send your users to your own support page instead. A typical use case for that is if you, the admin, want to generate installers but only download them yourself and present them on your own Govroam support page.



The third part of profile generation is about the EAP types which you've configured in your RADIUS server for this user group. By simple drag&drop, please drag all the EAP types you support into the upper green area. The list is ordered by preference, so drag the EAP types into your preferred order. The CAT will always compare the EAP types you've configured here with the capabilities of the various devices which are to be configured. If the device supports your most preferred EAP type, installers will always be generated for that EAP type. If your preferred EAP type does not work on a given device, the preference list is worked through until a match occurs, and then installers for that device will use that not-so-preferred EAP type (which is better than not supporting Govroam configuration at all). Finally, if there is a complete mismatch between the EAP types you support and the EAP types on a device, then we can't generate installers for that device. You might be luckier if you can change your

RADIUS setup to support more EAP types then.



EAP Details

In the EAP Details section, you can upload common properties of your RADIUS installation's EAP configuration. If you specify something here, the settings will be used for all the user profiles you define (see below), unless you choose to override them in one of the profiles.

For most EAP methods, the required EAP details are

- The Certification Authority (CA) certificate(s) which signed your EAP server certificate
  - always include the root CA (root CAs are indicated with a blue circled “R” besides the certificate details after upload)
  - optionally include intermediate CAs (intermediate or server certificates are indicated with a blue circled (“I”) besides the certficate after upload)
- The name of your server as specified in the Common Name (CN) of your EAP server certificate

Note 1 - server certificates

There is no point in uploading the server certificate itself. The server certificate is sent during the EAP exchange during login time to the client. Contrary to that, the CA certificates are needed because they are the trust anchor on the client device which it uses to verify that incoming server certificate.

Note 2 - CA requirements

Various client device operating systems have specific requirements about which CA certificates and server certificates they accept. For more information, please see EAP Server Certificate considerations.

Note 3 - CA rollover support

You can upload multiple root CA certificates simultaneously to CAT. On all supported client OSes, all of them will be installed and all will be marked trusted. This enables CA vertificate rollow without a flag day: User devices which were configured with an upcoming new root CA ahead of time will then not even notice the change of server cert from old to new trust root (so long as the Common Name of the server certificate remains unchanged during the rollover).

Almost all CAT-support client operating systems support mutliple trust roots. There is only one fraction of CAT-supported client OSes which does not support multiple root CAs: Android versions < 7.1. For those, due to an API limitation we are not able to do anything about, only one root CA will be installed; the API also cannot install any intermediate CAs at all. To isolate Android users while giving everyone else multiple trust roots early, you could create a different profile (see next section) just for Android and only load the desired root CA into that profile). Android 7.1 finally got its support for multiple trust roots; the GovroamCAT app already supports that.

Given the update situation on the Android platform, it is naive to think that the unsupported root CA rollover problem will wither out in anything less than five years. There is unfortunately nothing we can do about it.

Overriding IdP-wide Settings

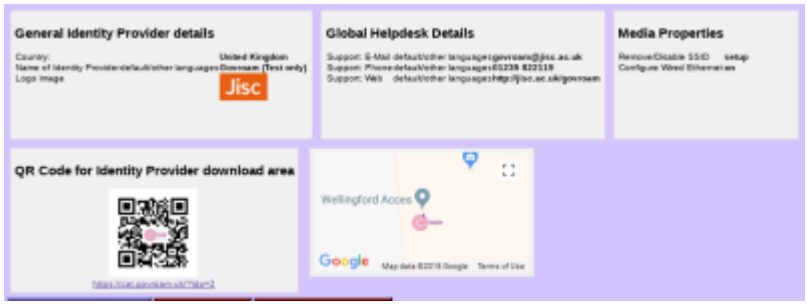
After these steps, you can enter/override helpdesk and media properties if you haven't done so on the organisation-wide settings already (see above). If you have entered one specific option organisation-wide already, and you enter something else here, then the settings on profile level supersede the organisation-level ones.



That's all - the CAT then proceeds to a sanity check of the things you have configured and will tell you about any things which need fixing, it any. You are then transported to the Organisation dashboard - from where you can continue to download your installers, change organisation or profile details, perform sanity checks and more.

Generating installers for my users

On the organisation dashboard page, you see the most important pieces of data that you have entered.

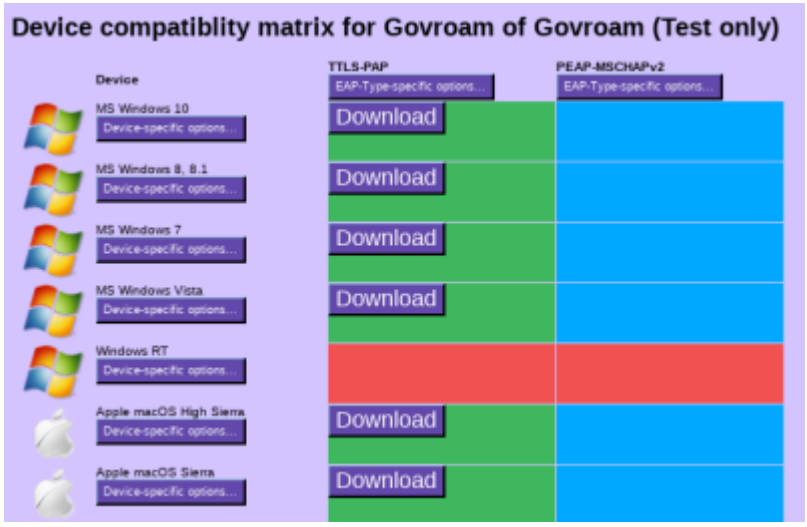


This data (and all profile-specific data) is used to create installers from. To actually get access to the installers, click on the “Installer Fine-Tuning and Download” button in your defined profile.



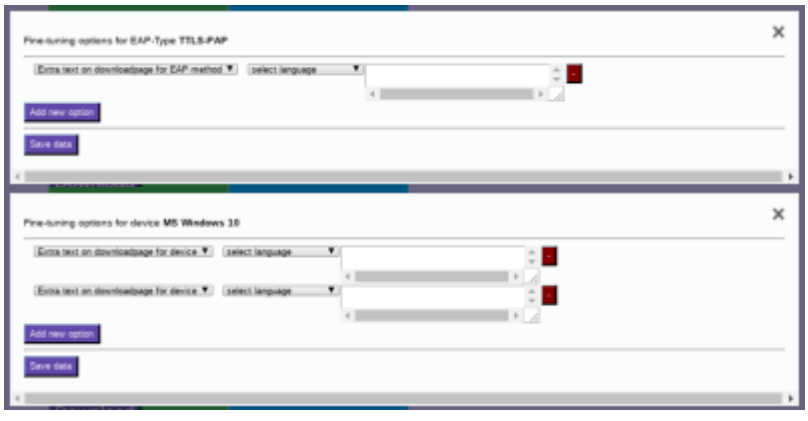
This will take you to the overview of available installers. It takes the form of a matrix of your enabled EAP types, the devices CAT knows about, and whether or not an installer for all the combinations is available.

- Green matrix entries mean that the installer is ready for use, and there is a Download button in these fields.
- Blue entries mean that CAT could create an installer for that combination, but there is a more highly preferred EAP type which it can serve as well; so that one is generated instead.
- Red entries mean that CAT does not know how to configure the EAP type on that device.
- Grey entries mean that you did not supply all required information for CAT to produce an installer for you - you would need to go back to IdP and/or Profile settings and fill in the missing pieces.
- White entries mean that you have set up an “exception” and CAT will not offer this combination to end-users, even if an installer may in principle be available (see next paragraph for details).



Maybe you have something special to communicate to your users? E.g. hints which password to use for EAP-TTLS, or which secretariat to turn to to get the client certificate for EAP-TLS? Maybe you ban Apple Smartphones from your campus and want to alert users to that end?

For all these options, the Fine-Tuning page has extra buttons: you can add free-text for either specific EAP Types or specific devices. This text will then be displayed on the user download page before the download begins. For devices, you can also specify a Redirect target; if this is set, CAT will not provide a download button, but instead will redirect users to the URL you specified. This could, for example, be useful if you have a custom-made or commercial installer for one of the devices, and don't want to use CATs services for that device. If this option is set, the background for this device will turn white in the matrix (see screenshot above).



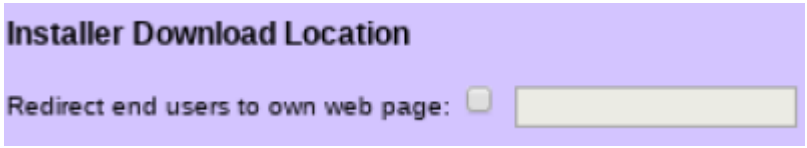
You can now push the download buttons and use the generated installers as you see fit. This is also possible for redirected devices; even though your users don't get this installer from CAT, you as an

admin might want to have it anyway, e.g. to include it in your own Govroam support pages.

Installer visibility on the user download page

You are in full control which of the installers, if any, and when you want to show on the CAT end-user download pages. Your control options are as follows:

- Make the EAP profile visible, but redirect users to your own support pages (entry is listed, but no download on the public page). This can be set in Profile options - see screenshot.



- Make the EAP profile visible with installers, but redirect certain devices to your own pages. Use the Fine-Tuning matrix to set the Redirect option for the device (see previous section).
- Make all installers visible.

All of three options will require confirmation by you that you have entered all details and have reviewed the profile to be “production-ready”. No details of your EAP deployment will be made visible until you have declared your data set production-ready. You do this by adding the option with that same name in your Profile properties.

The visibility status of your EAP deployment is indicated with either a green (published) or yellow (unpublished) status icon on the Profile info (see screenshot). If the status is yellow, you can hover with your mouse over it to get a more detailed explanation why the profile is not published.



Verifying my RADIUS setup

If you have supplied the CAT with the realm which you are using in Govroam, an extra service is enabled for you: the CAT can send live data probes through the Govroam infrastructure to see if your realm's RADIUS server is reachable and whether it passes various sanity checks. All these tests are triggered by pushing the button “Check realm reachability”. You will be presented with an overview page immediately while various tests are executed in the background:

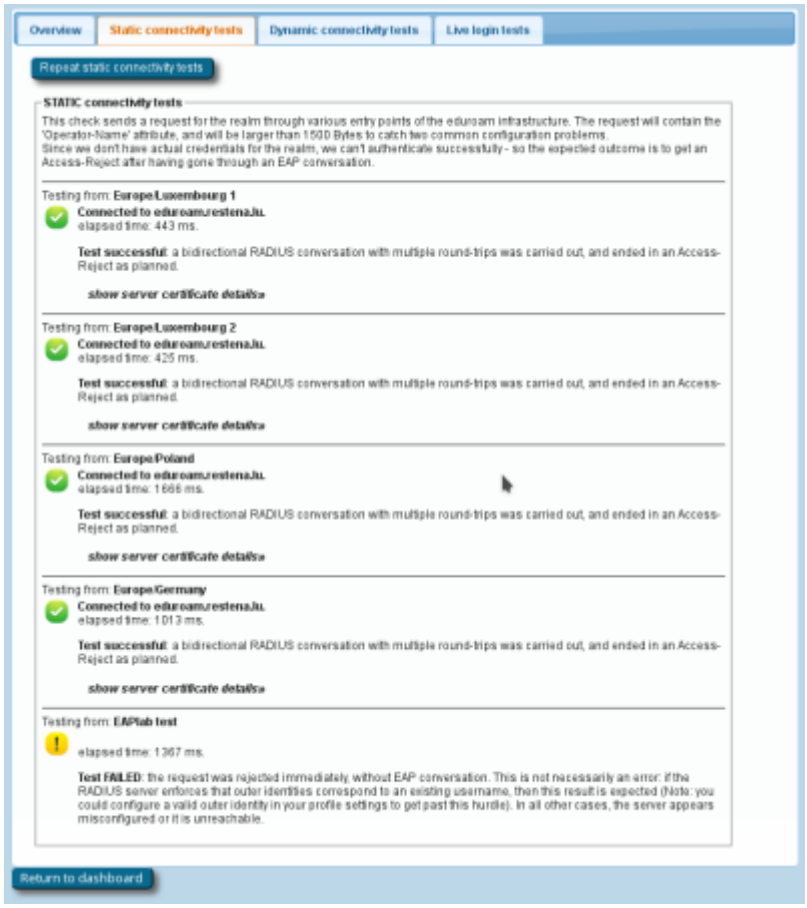
The tests will take a few to several tens of seconds, and will give you an in-depth overview of how your RADIUS server is doing in the world of Govroam. The tests include

- a DNS check whether your realm is publishing NAPTR records for Govroam Dynamic Discovery; and if so, whether all DNS records are correct (**currently NAPTR records aren't an option for Govroam**). If the DNS checks were successful, the CAT will make actual use of the discovered RADIUS Dynamic Discovery server targets and try to connect. It will present a mix of

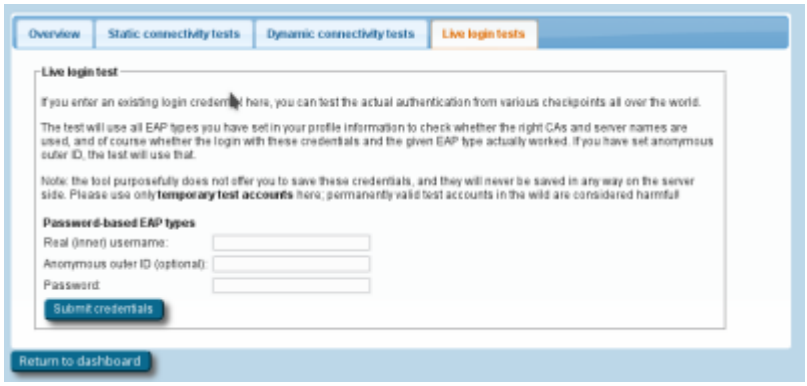
valid and invalid certificates and will check whether the server acted correctly on receipt of these certificates.



- the results of actual authentication tests which were sent in the moment you pushed the button: these will not log anybody in (we don't have actual user credentials) but even with the planned failed authentication, we can run lots of diagnosis on your server. The web page will let you know if we found some oddities you might want to take care of:
    - Authentication round-trip times to your realm which take more than 5 seconds are suspicious
    - Your server must be able to send and receive UDP fragments (some firewalls choke on that)
    - There are a number of RADIUS attributes that are commonly present in authentication requests; some servers behave strangely on receipt - we'll let you know if yours is problematic
    - Checks regarding the structure and validity of your server, intermediate and root CA certificates. These checks are as thorough as checking everything that is described in prose on the EAP Server Considerations page. Here is a typical output if your server certificate is “from the 1990s” (i.e. didn't keep up with all the recommendations and requirements on server certificates in recent years):



- If you feel comfortable giving CAT access to short-lived real authentication credentials (for debugging purposes with test user accounts only!), then you can run an actual positive authentication test; in which case we can run even more diagnosis.



Other features

User API

A full access WEB API makes it possible to create different user interfaces to CAT. In particular you can list countries with configured organisations, list organisations globally or within a country, list profiles within organisation, ask for the organisation logo or even geolocate users' IP address and, of course download installers for given user profiles and devices.

Silent Windows installers

CAT 1.1 Windows installers can be run silently with the /S flag, which is useful for organisations which want to build the installers into their own, larger ones.

Getting Help with Govroam CAT

If you have any questions about the Govroam CAT website or the underlying software, don't hesitate to ask on the mailing list cat-users@lists.geant.org . If possible, please subscribe to the list before posting; this guarantees that you'll get replies even if someone forgets a “reply to all”, and also ensures that your post doesn't accidentally get classified as spam and discarded.

Credits

This guide was originally written by GEANT and released under the CC-BY-SA 3.0 licence. Thanks to Stefan Winter and the rest of the GEANT team for allowing us to re-use their documentation. Changes have been made to make it more specific to Govroam.

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