



GROUPE DEPROVISIONING

PRESENTED BY: Chris Hyzer, Penn

Agenda

- Explain deprovisioning strategy and issues
- Current situation at Penn
- Problem statement
- Making deprovisioning easier with Grouper legacy features
- Improvements at Penn
- Grouper deprovisioning

Deprovisioning strategy and issues



Deprovisioning

- Removing access for the following reasons
 - No longer Penn affiliated
 - No longer employee
 - No longer IT department related
 - Switches positions in the IT department
 - Not working on a project anymore

Current deprovisioning procedure

- Email to a listserv from IT dept HR
 - Deprovision this stuff for this person
- | | |
|----------------------------|-------------------|
| • Box | • Flash |
| • Listserv | • FAST Apps |
| • Phone | • Atlassian |
| • Voicemail | • Remedy |
| • LAN | • Org Chart |
| • Data Warehouse | • Building Access |
| • Mainframe | • PlanView |
| • Email/O365 Acct | • LVS |
| • Databases | • ISC Web Site |
| • Applications and Servers | • CVS |

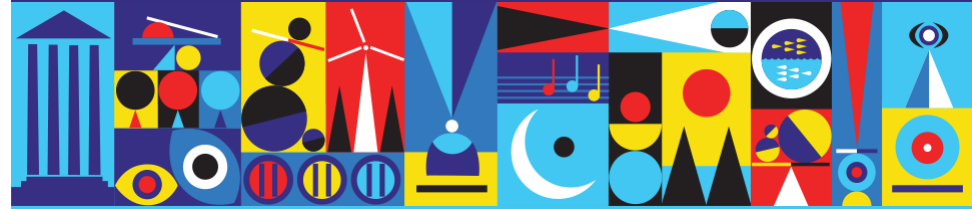
Issues with current procedure

- Is that the full list?
 - How many services do we have? (hundreds)
- What if someone misses the email?
- What if no email sent?
- What if IdM status is not right
 - (e.g. still getting vacation pay after leaving, out for disability)

Issues with procedure (continued)

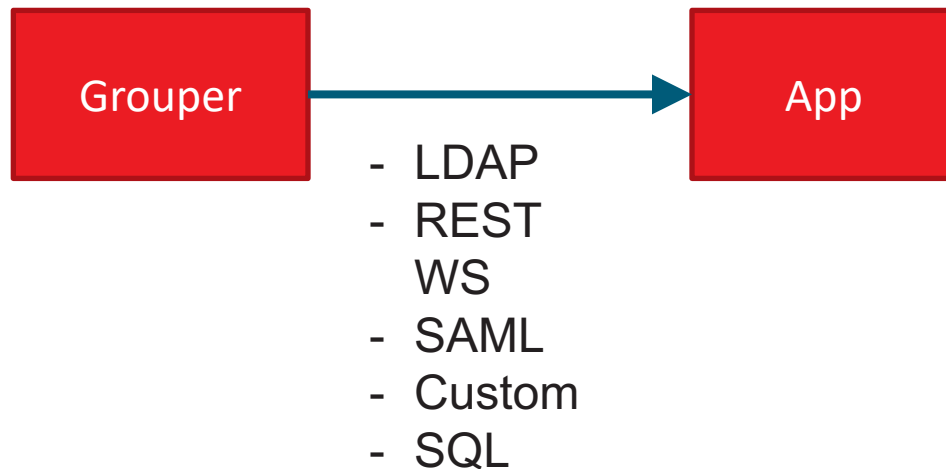
- I get an email I don't recognize the person
- I assume they don't have access, I don't check, but wait the situation worsens
- One example is our framework
 - Each of the 100 apps has 3+ envs (dev/prod/test)
 - Each app has local security
 - Need to log in to each to see
- Tedious to check, turnover from contractors...

Deprovisioning current options



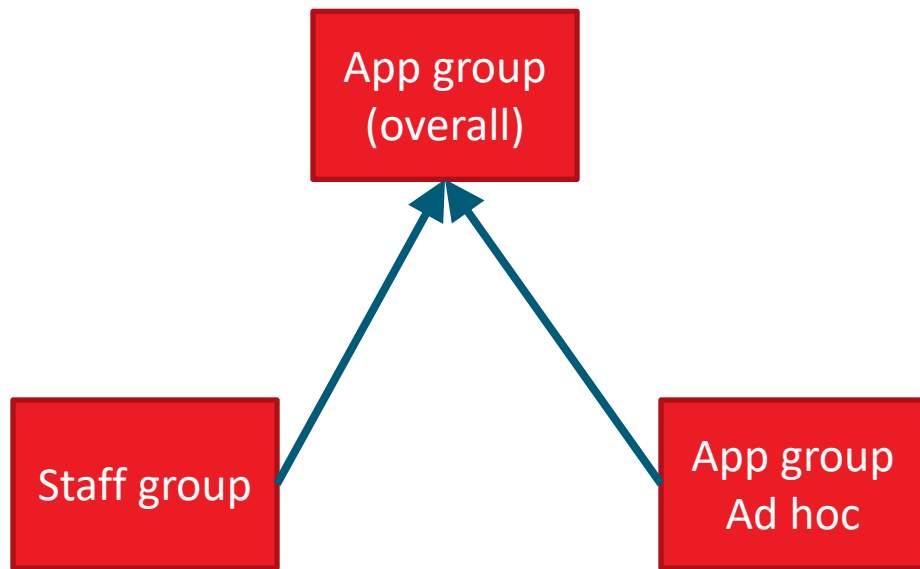
Current option #1

- App automatically deprovisions
- via Grouper or IdM or entitlement



Current option #2

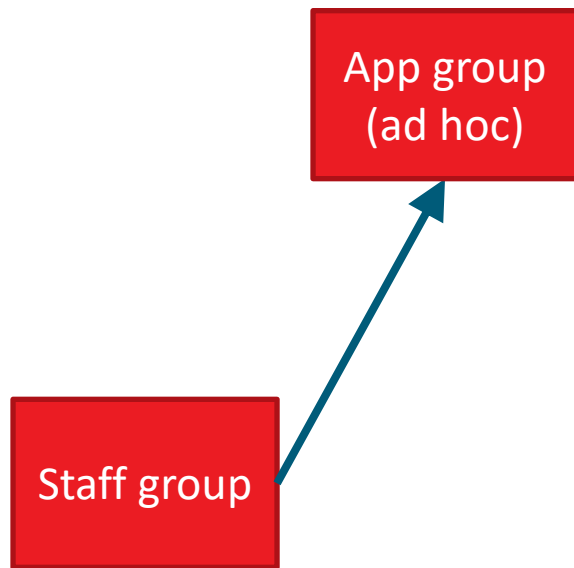
- Composite group



- If someone in the ad hoc group
- Is not in the staff group
- They will not be in the overall group
- Composite intersection

Current option #3

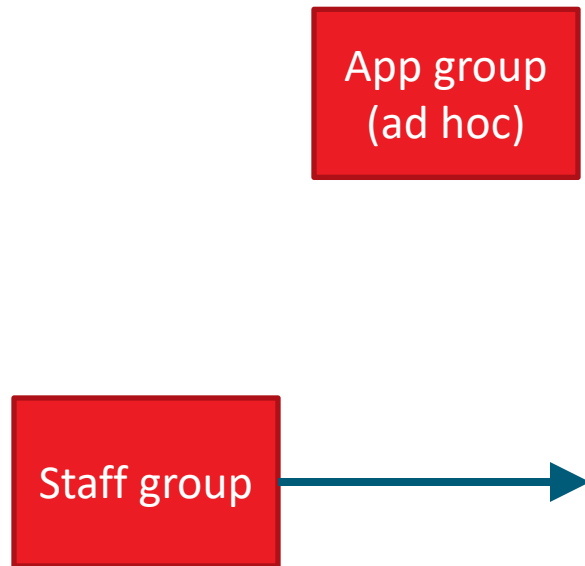
- Rule unassigning



- If someone is removed from the staff group
- And they are in the ad hoc group
- They will be removed from the ad hoc group

Current option #4

- Rule to notify me



- If someone is removed from the staff group
- And they are in the ad hoc group
- Send an email to the admins of the ad hoc group to review

Current option #5

- Grouper (not automatically)

App group
(ad hoc)

- When I get a email about deprovisioning
- I try to look in Grouper and do all the unassigning

Current option #6

- Grouper (automatically)

App group
community

- “Loaded group”
- Faculty,
Students, or All
Staff
- Or an org like
ISC staff

Current option #7

- Attestation



App group
Ad hoc

- Configure at Group or Folder level
- Email reminders to review group, don't ignore
- Admins review memberships
- Mark the group as reviewed

Current option #8

- Combine some of those
 - Auto remove
 - Notify admins
 - Attest periodically

The problem

- Why not drive all access from Grouper and rules?
- App not compatible
- Existed before Grouper implementation
- Too much effort or perceived effort to integrate
- Prefer to assign privileges with the app's UI

Improving deprovisioning with current Grouper features



Making deprovisioning easier

- Auto-feed entitlements to Grouper read only
- Grouper can notify you to remove access
 - When the email goes around
 - When someone's org changes
- You can take advantage of other features
 - Attestation
 - Reports against active employees at in org
 - View your apps privilege history
 - More accurate picture of what someone has access to
 - More easily clone access onboarding someone new

Analyze memberships in Grouper

- Composite <minus> the group of app users with active community members
- Shows users suggested to be removed

Custom web application example

- Make a SQL view of memberships from framework
- Load that into Grouper (read only)
- When someone is deprovisioned email the admin of that application
- Send monthly reports or on demand
- Attest the access periodically

Step 1: make the view

```
CREATE OR REPLACE FORCE VIEW FAST_USER_GROUP_V
(
    PENNID,
    GROUP_NAME_SYSTEM,
    PENNKEY,
    EMAIL_ADDRESS,
    NAME
)
BEQUEATH DEFINER
AS
SELECT pennid,
       group_name_system,
       pennkey,
       email_address,
       name
FROM   fast_user fu, fast_group fg, fast_user_group fug
WHERE  FU.USER_ID = FUG.USER_ID
       AND FG.GROUP_ID = FUG.GROUP_ID
       AND (FUG.DISABLED_DATE IS NULL OR FUG.DISABLED_DATE > SYSDATE)
       AND (FG.DISABLED_DATE IS NULL OR FG.DISABLED_DATE > SYSDATE)
       AND (FU.DISABLED_DATE IS NULL OR FU.DISABLED_DATE > SYSDATE);
```

Step 2: grant the view to Grouper for loader

```
GRANT SELECT ON FAST_USER_GROUP_V TO AUTHZADM WITH GRANT OPTION;
```

Step 3: see the groups

PENPID	GROUP_NAME_SYSTEM
10012528	FAST_AUTHENTICATED
10021368	FAST_ADMIN
10021368	eraAdmin
10064187	FAST_ADMIN
10198457	FAST_ADMIN
69795056	FAST_ADMIN
10754302	Change Management Admin
10754302	FAST_ADMIN
10120893	eraAdmin
10021294	eraAdmin

Step 4: see the grouper view

SUBJECT_ID	SUBJECT_SOURCE_ID	GROUP_NAME
10009265	pennperson	penn:isc:ait:apps:fast:groups:fastPdfService:prod:FAST_ADMIN
10011435	pennperson	penn:isc:ait:apps:fast:groups:fastPdfService:prod:Change_Management_Admin
10013603	pennperson	penn:isc:ait:apps:fast:groups:fastPdfService:prod:eraAdmin
10015227	pennperson	penn:isc:ait:apps:fast:groups:fastPdfService:prod:Communications
10015227	pennperson	penn:isc:ait:apps:fast:groups:fastPdfService:prod:Change_Management_Approver
10018011	pennperson	penn:isc:ait:apps:fast:groups:fastPdfService:prod:Client_Services
10018011	pennperson	penn:isc:ait:apps:fast:groups:fastPdfService:prod:Technology_Support_Services
10018011	pennperson	penn:isc:ait:apps:fast:groups:fastPdfService:prod:Change_Management_Approver
10019545	pennperson	penn:isc:ait:apps:fast:groups:fastPdfService:prod:FAST_ADMIN
10019545	pennperson	penn:isc:ait:apps:fast:groups:fastPdfService:prod:eraAdmin
10019545	pennperson	penn:isc:ait:apps:fast:groups:fastPdfService:prod:Change_Management_Approver
10019545	pennperson	penn:isc:ait:apps:fast:groups:fastPdfService:prod:Application_Services
10020464	pennperson	penn:isc:ait:apps:fast:groups:fastPdfService:prod:Client_Services
10020464	pennperson	penn:isc:ait:apps:fast:groups:fastPdfService:prod:Technology_Support_Services
10020464	pennperson	penn:isc:ait:apps:fast:groups:fastPdfService:prod:Change_Management_Approver
10021368	pennperson	penn:isc:ait:apps:fast:groups:fastPdfService:prod:FAST_ADMIN

Step 5: It's on the UI too

Home > Root > penn > isc > ait > apps > fast > groups

groups

More ▾

Folder contents Privileges More ▾

Filter for:

Name ▾
^ Up one folder
fastPdfService
srfsPdf

Show: ▾

Step 5: It's on the UI too

Home > Root > penn > isc > ait > apps > fast > groups > fastPdfService



fastPdfService

More ▾

Folder contents Privileges More ▾

Filter for:

Name ▾

- ⤴ Up one folder
-  prod
-  test

Show: ▾

Step 5: It's on the UI too









Home > Root > penn > isc > ait > apps > fast > groups > fastPdfService > prod

prod

More ▾

Folder contents Privileges More ▾

Filter for:

Name ▾
^ Up one folder
 Administrative_Information_Technology_and_Data_Admin
 Application_Services
 Change_Management_Admin
 Change_Management_Approver
 Client_Services
 Communications
 Computer_Operations
 FAST_ADMIN

Step 5: It's on the UI too

Home > Root > penn > isc > ait > apps > fast > groups > fastPdfService > prod > Client_Services

Client_Services

Client_Services auto-created by grouperLoader







More ▾

Members Privileges More ▾

The following table lists all entities which are members of this group.

Filter for:


Remove selected members **Uh....**

<input type="checkbox"/> Entity name ▾	Membership
<input type="checkbox"/>  Ma 	Direct
<input type="checkbox"/>  Ant 	Direct
<input type="checkbox"/>  Ian 	Direct

Show: Showing 1-3 of 3 · First |

Step 6: Attestation

Home > Root > penn > isc > ait > apps > fast > groups > fastPdfService

 **fastPdfService**

More ▾

Folder contentsPrivilegesMore ▾

Stem attestation Att

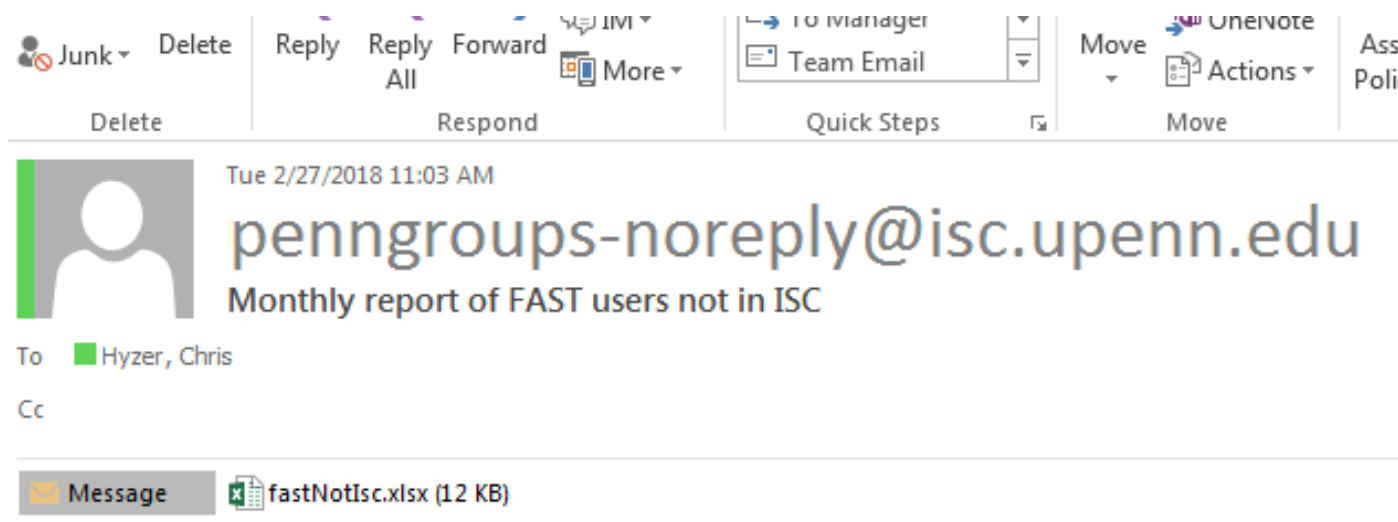
No attestation is configured on this folder or parent folder

Attestation	<div>Yes, does have attestation directly assigned ▾</div> <div>If this folder has attestation configured on it directly, not inherited from ancestor folder</div>
Has attestation	<div>Yes, attestation is enabled ▾</div> <div>If configured to be attested. It is possible that attestation is configured to be off.</div>

Step 6: Attestation

Send email	Yes, send email alerts (recommended) ▼
If email alerts should be sent out to people who need to review the membership	
Email group managers	Yes, email the group admins and updaters ▼
If the group managers (can ADMIN or can READ and UPDATE) should be emailed wh	
Use default recertify days	Yes, use default recertify days (180 days) ▼
Use the system wide default of 180 days for recertification	
Folder scope	All groups in this folder or subfolders ▼
Do these attestation settings affect groups in this folder and all subfolders (default) or c this folder	

Step 7: Monthly report



Attached is your monthly report of FAST users not in ISC.
Please review and mark the groups as attested in penngroups.

Thanks

Step 8: LOTS OF WORK TO DO

B	C
	DESCRIPTION
IfService:test:eraAdmin	Mo
IfService:prod:Change_Management_Ap	Ma
If:test:FAST_ADMIN	Ric
IfService:prod:eraAdmin	Hea
IfService:prod:eraAdmin	Par
IfService:prod:eraAdmin	Car
IfService:test:eraAdmin	Tod
IfService:prod:eraAdmin	Rob
IfService:prod:eraAdmin	Ste
IfService:test:dbPasswordAdmin	Juli
IfService:prod:FAST_ADMIN	Juli
IfService:test:eraAdmin	Ani
IfService:prod:Change_Management_Ap	Ma
IfService:prod:FAST_ADMIN	Cra
IfService:prod:Network_Engineering_and	Ma
IfService:test:eraAdmin	Jan
IfService:prod:Computer_Operations	Ma
IfService:test:FAST_ADMIN	Cra
If:dev:FAST_ADMIN	Ric
IfService:test:dbPasswordAdmin	Tuli
IfService:prod:FAST_ADMIN	...

Oracle schema accounts

- Add all the schemas
- Make sure not already disabled
- Make sure they are a person and not an application

Oracle schema accounts





Home > Root > penn > isc > ait > apps > oracle > groups

groups

More ▾

Folder contents Privileges More ▾

Filter for:

Name ▾
 Up one folder
 pennCommunity
 rac
 warehouse

Oracle schema accounts



Home > Root > penn > isc > ait > apps > oracle > groups > pennCommunity

pennCommunity

More ▾

Folder contents Privileges More ▾


Filter for:

Name ▾
^ Up one folder
 pcom
 tcom

Show: ▾

Oracle schema accounts POC

Home > Root > penn > isc > ait > apps > oracle > groups > pennCommunity > tcom

 **tcom**

tcom auto-created by grouperLoader

More ▾







MembersPrivilegesMore ▾

+ Add member


More action

The following table lists all entities which are members of this group.

Filter for: All members ▾ Member name Apply filter Reset

Remove selected members		
<input type="checkbox"/> Entity name ▾	Membership	Choose action
<input type="checkbox"/>  Ja [REDACTED] uer	Direct	Actions ▾
<input type="checkbox"/>  Pa [REDACTED] nan	Direct	Actions ▾
<input type="checkbox"/>  Ac [REDACTED]	Direct	Actions ▾
<input type="checkbox"/>  Ag [REDACTED]	Direct	Actions ▾
<input type="checkbox"/>  Al [REDACTED] ie	Direct	Actions ▾
<input type="checkbox"/>  Al [REDACTED]	Direct	Actions ▾

109 accounts in test idm database non-staff!!!!!!!

 **tcom_nonstaff**

More ▾

+ Add members


More actions

Members

Privileges

More ▾

The following table lists all entities which are members of this group.

Note: this group is a composite owner:  tcom_nonstaff is a composite of  tcom minus  staff

Filter for:






All members ▾


Member name

Apply filter

Reset

Remove selected members

<input type="checkbox"/> Entity name ▾	Membership	Choose action
<input type="checkbox"/>  Ag [REDACTED]	Indirect	Actions ▾
<input type="checkbox"/>  Alb [REDACTED]	Indirect	Actions ▾
<input type="checkbox"/>  Dr [REDACTED] en	Indirect	Actions ▾
<input type="checkbox"/>  Alt [REDACTED]	Indirect	Actions ▾
<input type="checkbox"/>  As [REDACTED] drow	Indirect	Actions ▾

 **isc_o365_users**

More ▾

Members

Privileges

More ▾







The following table lists all entities which are members of this group

Filter
for:


All members ▾

Member name

Remove selected members

<input type="checkbox"/> Entity name ▾	Membership
<input type="checkbox"/>  J...	Direct
<input type="checkbox"/>  N...do	Direct
<input type="checkbox"/>  T...	Direct
<input type="checkbox"/>  A...	Direct
<input type="checkbox"/>  A...	Direct
<input type="checkbox"/>  S...	Direct

Home > Root > penn > isc > ait > apps > O365 > isc > isc_o365_users_non_isc

 **isc_o365_users_non_isc**

+ Add members

More actions ▾




More ▾

Members

Privileges

More ▾

The following table lists all entities which are members of this group.

Note: this group is a composite owner:  [isc_o365_users_non_isc](#) is a composite of  [isc_o365_users](#) minus  [iscstaff](#)

Filter for:




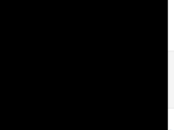

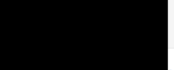
All members ▾

Member name

Apply filter

Reset

Remove selected members

<input type="checkbox"/>	Entity name ▾	Membership	Choose action
<input type="checkbox"/>	 	Indirect	Actions ▾
<input type="checkbox"/>	 	Indirect	Actions ▾
<input type="checkbox"/>	 	Indirect	Actions ▾

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Home > Root > penn > isc > ait > apps > kite > accounts > prod_kite_enabled





prod_kite_enabled

More ▾


Members Privileges More ▾

The following table lists all entities which are members of this group.

Filter for:

<input type="checkbox"/>	Entity name ▾	Membership	Choose
<input type="checkbox"/>	 Y... [REDACTED]	Direct	<input type="button" value="Actions"/>
<input type="checkbox"/>	 R... [REDACTED]	Direct	<input type="button" value="Actions"/>
<input type="checkbox"/>	 A... [REDACTED]son	Direct	<input type="button" value="Actions"/>
<input type="checkbox"/>	 L... [REDACTED]hs	Direct	<input type="button" value="Actions"/>



Home > Root > penn > isc > ait > apps > kite > accounts > prod_kite_nonstaff

 **prod_kite_nonstaff**

More ▾

MembersPrivilegesMore ▾

The following table lists all entities which are members of this group.

Note: this group is a composite owner:  prod_kite_nonstaff is a composite of  prod_kite_enabled




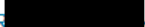
Filter for:

All members ▾

Member name

Apply

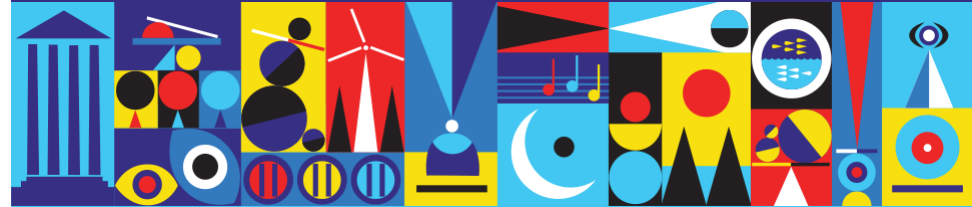
Remove selected members

<input type="checkbox"/>	Entity name ▾	Membership
<input type="checkbox"/>	 Y 	Indirect
<input type="checkbox"/>	 R 	Indirect

Will do in future

- Unix accounts (via script and WS)
- Sudo entries (via script and WS)
- Door access (feed into database and SQL loader)
- All other deprovisioning applications

Grouper deprovisioning



Grouper deprovisioning

- Soon to be released in 2.3 patch and 2.4
- <https://spaces.internet2.edu/display/Grouper/Grouper+deprovisioning>
- Allow deprovisioning administrators to deprovision access
 - Could be HR
 - For “red button”

Grouper deprovisioning enabled

- This feature is enabled by default
- You can disable it if you like in grouper.properties

```
#####  
## Deprovisioning  
#####  
  
# if deprovisioning should be enabled  
deprovisioning.enable = true
```

Grouper deprovisioning realms

- Identify affiliations, depts, cohorts, to deprovision

```
# comma separated realms for deprovisioning e.g. employee, student, etc
# these need to be alphanumeric suitable for properties keys for further c
deprovisioning.realms =
```

Grouper deprovisioning act as admin

- If the deprovisioning admin is an inherited admin in a folder, then you don't need this
- If you have an HR person deprovisioning employees, this might be useful

```
# users in this group who are admins of a realm but who are not Grouper SysAdmins, will be  
# able to deprovision from all grouper groups/objects, not just groups they have access to UPDATE/ADMIN  
deprovisioning.admin.group = $$deprovisioning.systemFolder$$:deprovisioningAdmins
```

Grouper deprovisioning built-in groups

- Managers who can deprovision each realm

Deprovisioning managers

Identify the deprovisioning managers and add them to the managers group. e.g. "employee", then the group would be:

```
etc:deprovisioning:managersWhoCanDeprovision_employee
```

Grouper deprovisioning built-in groups

- Deprovisioned users
- etc:deprovisioning:usersWhoHaveBeenDeprovisioned_employee
- Internal group that Grouper uses to add users who have been deprovisioned
- Sets an end date according to grouper.properties
- Defaults to 2 weeks

```
# number of days in deprovisioning group. Should be the amount of time for  
# systems of record to catch up and  
# for people to change external systems of record in manual processes  
deprovisioning.defaultNumberOfDaysInDeprovisioningGroup = 14
```

Configure folders and groups to be deprovisioned

- Identify a folder or group to have deprovisioning configuration
- Do this in the UI as the deprovisioning realm admin
- This configuration is realm specific

Deprovision users

- Once deprovisioning and realms are configured, start deprovisioning

Miscellaneous

Functions across the repository

Inherited privileges

Subject API diagnostics

Instrumentation

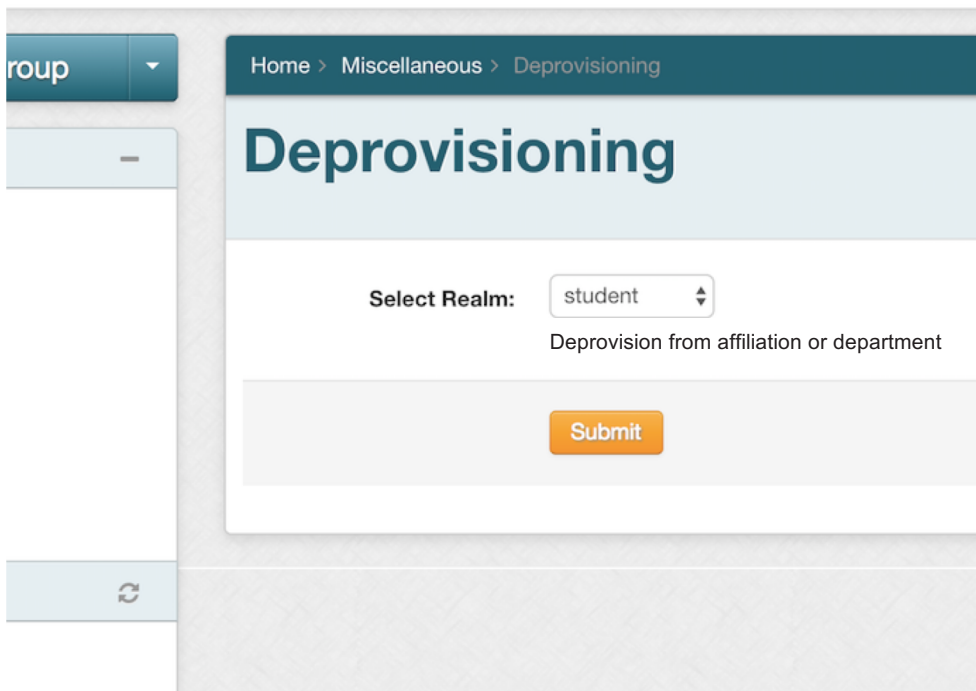
Loader jobs

Attestation

Deprovisioning

Deprovision users

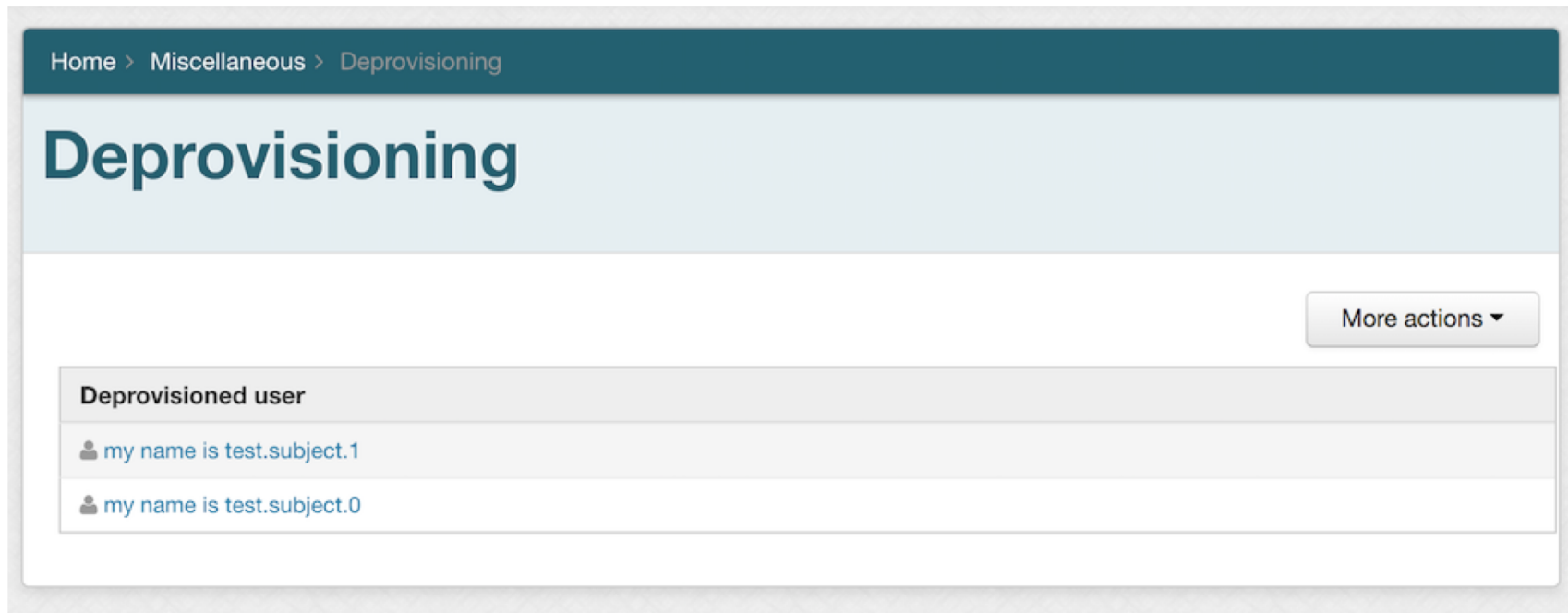
- Select realm to be deprovisioned





The screenshot shows a web interface for deprovisioning users. On the left is a sidebar with a 'roup' dropdown menu and a minus sign. The main content area has a breadcrumb trail 'Home > Miscellaneous > Deprovisioning' and a large heading 'Deprovisioning'. Below the heading is a 'Select Realm:' label followed by a dropdown menu currently showing 'student'. Underneath the dropdown is the text 'Deprovision from affiliation or department'. At the bottom of the form is an orange 'Submit' button. A refresh icon is visible in the sidebar at the bottom.

Deprovision users

- See recently deprovisioned users
 - check up on access removal

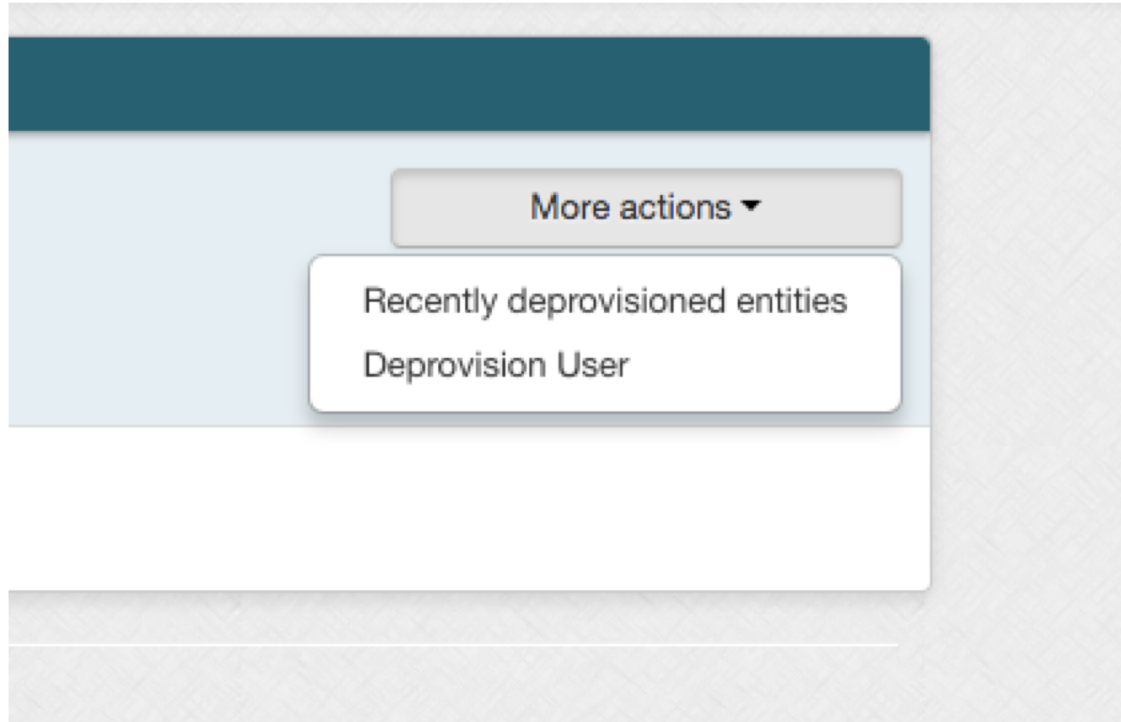


The screenshot shows a web application interface for managing deprovisioned users. At the top, a breadcrumb trail reads "Home > Miscellaneous > Deprovisioning". Below this, the title "Deprovisioning" is displayed in a large, bold font. On the right side, there is a button labeled "More actions" with a downward arrow. The main content area features a table with the header "Deprovisioned user". The table contains two rows, each with a user icon and the text "my name is test.subject.1" and "my name is test.subject.0" respectively.

Deprovisioned user
 my name is test.subject.1
 my name is test.subject.0

Deprovision users

- Deprovisioning menu



Deprovision users

- Deprovision a user in a realm

Home > Miscellaneous > Deprovisioning > Deprovision user

Deprovision from realm: employee

Search for a user to view their access and deprovision them

Member name or ID:

- description.test.subject.0
- description.test.subject.1
- description.test.subject.2
- description.test.subject.3
- description.test.subject.4
- description.test.subject.5
- description.test.subject.6
- description.test.subject.7
- description.test.subject.8
- description.test.subject.9

See access, remove it

Member name or ID:












Enter an entity name or ID, or [search for an entity](#).

[View user access to deprovision](#)

Below are the directly assigned memberships and privileges. Objects which are restricted from deprovisioning are not shown by default.

Reason:

[Deprovision user and remove access](#)

<input checked="" type="checkbox"/>	Folder	Object	Object type	Group Member?	Privileges
<input checked="" type="checkbox"/>	etc : grouperUi	 grouperUiUserData	Group	true	
	testC	 groupC	Group	true	
<input checked="" type="checkbox"/>	testD	 groupD	Group	true	
<input type="checkbox"/>	testA	 groupA	Group	false	Admin, Read, Update
<input type="checkbox"/>	testB	 groupB	Group	false	Admin
<input checked="" type="checkbox"/>	testC	 groupC	Group	false	Admin, Optout
<input checked="" type="checkbox"/>	testD	 groupD	Group	false	Attribute read, Attribute update
<input checked="" type="checkbox"/>	testE	 groupE	Group	false	Admin
<input checked="" type="checkbox"/>	Root	 testA	Folder	NA	Create, Attribute read
<input checked="" type="checkbox"/>	testA	 stemA	Folder	NA	Admin
<input checked="" type="checkbox"/>	testA	 testAttributeDef	Attribute	NA	Attribute read, Update, View

Configure deprovisioning enabled

- true|false,
 - true to deprovision (default to true)
 - false to not deprovision
- Note, if this is set on a daemon job, then it will not deprovision any group in the loader job
- If you do/don't want people deprovisioned
- If it is (un)related to the deprovisioning realm
- Do not show a checkbox on the deprovisioning screen
- Do not restrict assignments during the 2-week deprovisioning period

Deprovisioning folder scope

- Sub (Default)
 - Applies to objects in this folder and subfolders
- One
 - Only applies to this folder

Deprovisioning configuration: email

- Send? true|false, default to false
 - Set this to true for objects where the system of record is outside of grouper or where manual removal is preferred
- Default email template in grouper.properties
- Custom email template configured on folder or group
 - Includes email, subject, email list to send to, or to admins of group
 - Similar to

Configuration: allow adds while deprovisioned

- False (default)
 - If a user tries to add this user to a group while in the 2-week deprovisioned window, give an error. But allow the user to override it
- True
 - If you want users added to the group or folder while deprovisioned in this realm

Configuration: auto change loader

- Default in the grouper.properties
 - Depends on your overall strategy
 - Useful when the systems of record do not update real-time when the red button is pressed
 - Useful if you don't have have a red button group excluded from your policy groups
- True (default)
 - If this is a loader job, if being in a deprovisioned group means the user should not be in the loaded group.
- False
 - Let the external SQL / LDAP be the system of record

Configuration: auto select for removal

- True (default): if the checkbox should be checked by default on the deprovisioning screen for a group/folder
- False: if the checkbox should not be checked. Allow the deprovisioning admin to check the checkbox based on circumstance

Configuration: show for removal

- True (default)
 - if the checkbox should be shown on the deprovisioning screen for a group/folder
- False: if the checkbox should not be shown.
 - If the group isn't related to the deprovisioning realm or if the system of record is not in grouper, then do not allow the deprovisioning administrator to remove the user

Configuration: realm group

- Might have conflicting realms
- Example: VPN used by employees and students
- Deprovisionable by both employees and students
- In grouper.properties

```
# Group name of the group that identifies generally if an entity is
# in this realm. So if a group is deprovisioned
# by various realms, then only deprovision if the entity in the group
# is not in any realm eligible group.
# e.g. VPN is deprovisioned by realms employee and student. If the person
# is no longer an employee, but is still
# a student, then dont deprovision.
# deprovisioning.realm_<realmName>.groupNameMeansInRealm = a:b:c
# deprovisioning.realm_employee.groupNameMeansInRealm = community:employee
```

Conflicting realms

- If a group has conflicting realms (e.g. apps:vpn:vpnUser_includes)
 - Deprovisionable by employee and student
- If an employee is deprovisioned, and not a student, check the checkbox
- If a student is deprovisioned, and not an employee, check the checkbox
- If has both realms, and one is removed, do not check the checkbox

UI effects

- Do not allow assignments of deprovisioned users to deprovisionable groups by realm
 - Screen will prompt if user wants to override

Loader effects

- Do not allow assignments of deprovisioned users to deprovisionable groups by realm
 - Useful if your system of record is not immediately up to date
 - Can remove all loader jobs from deprovisioning users in grouper.properties
 - Can remove each individual loader job from deprovisioning by realm
 - If there are issues, then everything will sync up after 14 days

WS effects

- Do not allow assignments of deprovisioned users to deprovisionable groups by realm
 - Can allow this in grouper.properties
- Allow an override param
 - allowAssignDeprovisionedUser=true

How to set this up

- See which departments / affiliations want to participate
- Create your realms
 - Start with employee?
- Carefully deprovision at first
 - Note which groups shouldn't be deprovisioned
 - Configure this realm and / or other realms
 - See which loader jobs are not real time if not all
- Get more applications to use Grouper as system of record
- Get more applications to send entitlements to Grouper read-only
- Use attestation / reports



Thanks

Grouper deprovisioning

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