



jFed and jFed experiences with AMv3

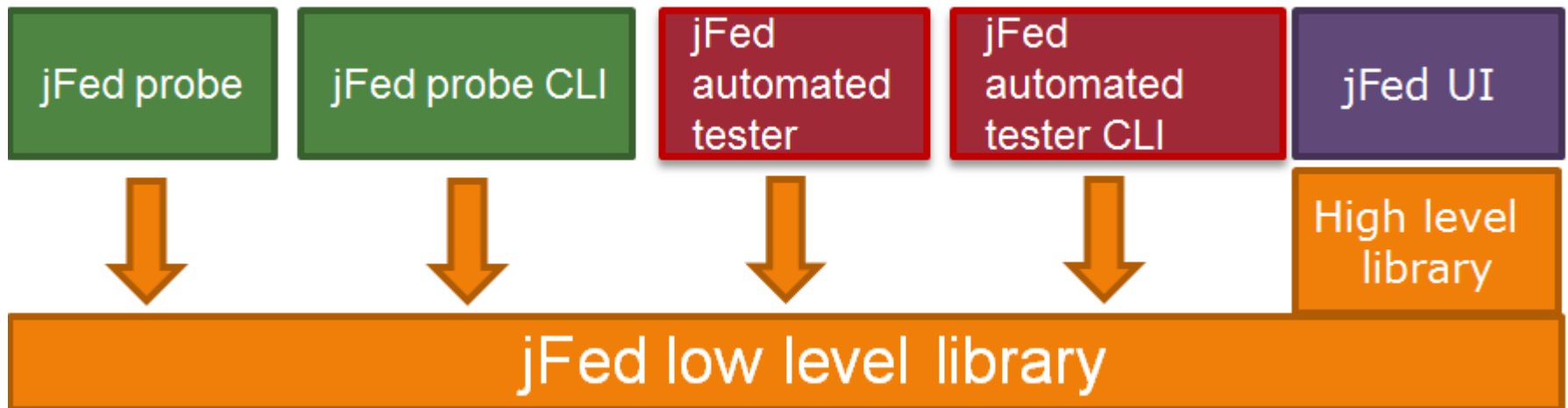
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GEC21

Date

jFed toolkit

- <http://jfed.iminds.be>, current release 5.3.0
- Speaks AM API, Federation (CH) APIs, SCS, ...
- Written in Java(FX)
- MIT license
- Test and monitor federation
- Experimenter tool jFed UI



jFed probe: manual testing + API learning

The screenshot displays the jFed probe interface for testing the Geni Aggregate Manager API v3. The left sidebar shows a tree view of API categories, with 'listResources' selected under 'Aggregate Manager v3'. The main panel shows the configuration for the 'listResources' command, including the server URL, authority, and arguments.

Server to use: Server of Logged in users Authority Server of Known Authority Custom Server URL

Authority: InstaGENI Illinois

Server URL:

Command: listResources

Arguments:

<input type="checkbox"/>	required	rspecType	<input type="text" value="geni"/>
<input type="checkbox"/>	required	rspecVersion	<input type="text" value="3"/>
<input type="checkbox"/>		available	<input type="checkbox"/>
<input checked="" type="checkbox"/>		compressed	<input checked="" type="checkbox"/>
<input type="checkbox"/>		extraOptions	<input type="text"/>

Geni Aggregate Manager API v3 - ListResources

Save all details: Request size (byte): 8126 Reply size(byte): 8286

Connection HTTP Request HTTP Reply XmlRpc Request XmlRpc Reply Geni Reply Value Geni Reply Code & Output Processed Geni Reply Value Stitching Debug Overvie

XmlRpc HashTable Received:

```
{
  "output": "",
  "code": {
    "protogeni_error_url": "https://www.instageni.illinois.edu/spewlogfile.php3?logfile=3f27d969ed99e0fc9416fa5079cc62e2",
    "protogeni_error_log": "urn:publicid:IDN+instageni.illinois.edu+log+3f27d969ed99e0fc9416fa5079cc62e2",
    "am_type": "protogeni",
    "geni_code": 0,
    "am_code": 0
  }
}
```

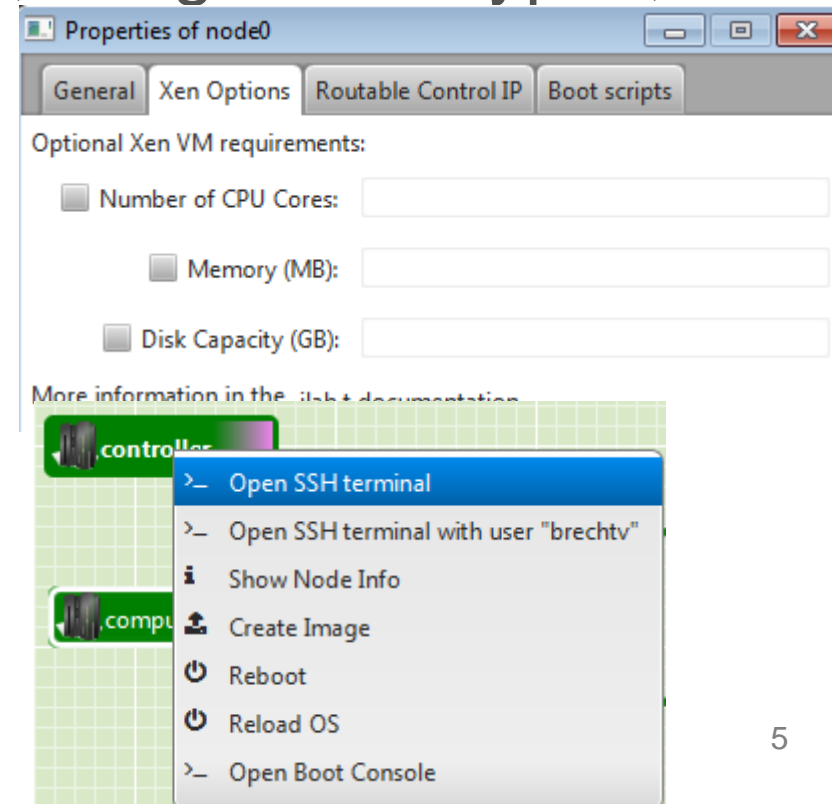
"value": "eJztXWtv4zaz/r6/QvCXtthjS9TFlo0kRdttewpst8UmW7zoF0ORaJtYwdLRJU7Or39JUbbIG81J
rKwVcwNkY5MPI89wRkNvSF39+DnPtOec7iSOriu07300HPixOKI ndefl 3W9dt/PizburFuwr9GR.

Experimenter GUI

The screenshot displays the jFed Experimenter Toolkit interface. The window title is "jFed Experimenter Toolkit". The main menu includes "General", "Topology Editor", "RSpec Editor", and "Timeline Editor". The "Topology Editor" tab is active, showing a toolbar with icons for Run, Save, Copy, Paste, Duplicate, Auto Layout, Zoom In, Zoom Out, and Reset Zoom. Below the toolbar is a "Computing Elements" panel with icons for Virtual Machine, Wireless Node, Physical Node, XEN VM, Generic Node, Dedicated Ext. Network Connection, and OpenVZ VM. The main workspace shows a network topology diagram on a grid background. The diagram consists of several nodes: "controller", "compute1", "compute2", "ChefServer", and "ChefWork". These nodes are interconnected by blue lines representing links. Specifically, "controller" is connected to "link3", "compute1" is connected to "link3" and "link4", "compute2" is connected to "link3", "link3" is connected to "link4", "link4" is connected to "ChefServer", and "link4" is connected to "ChefWork". A small blue circle is visible near the connection between "compute2" and "link3". At the bottom of the window, there is a taskbar with several tabs: "Untitled", "test5", "Untitled1", "st10", "st11", "st12", "Untitled2", "st13", "openst2", "chef-v3-test-no-links-chef-v3 X", and "openst3". The iMinds logo is in the bottom left corner, and the text "Click and drag the circle to a target node to create a new link." is at the bottom center. The bottom right corner shows system tray icons and the text "Proxy enabled for SSH-sessions only".

Cool new features


- Linked in the GENI portal
 - We now talk AMv3 to instageni/protogeni
 - GENI CH: fetch users, keys, register slivers, recover
 - XEN options, boot scripts, exogeni VM types, shared vlan
-
- Disk images, reboot, Reload, boot console
 - Bind unbound RSpecs



Cool new features

- Detailed exp. dates and renew

Renew Experiment

Enter the new experiment duration: 

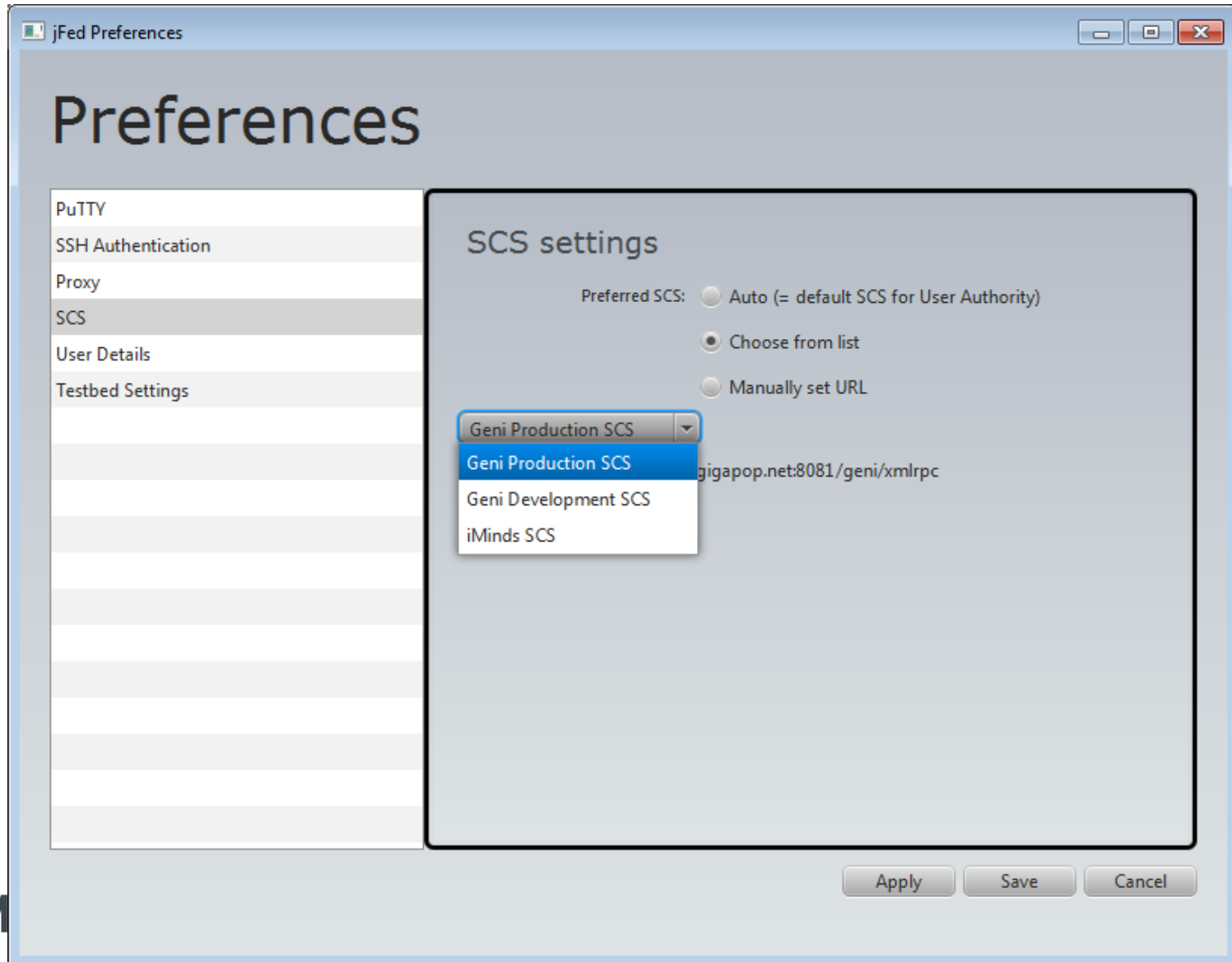
Please select the authorities where the experiment run expiration time should be renewed:

	Slice name	Expiration	Duration left
<input checked="" type="checkbox"/>	InstaGENI Utah DDC	2014-10-04 07:54:53	13 hours and 36 minutes
<input checked="" type="checkbox"/>	iMinds Virtual Wall 1	2014-10-04 07:54:53	13 hours and 36 minutes
<input checked="" type="checkbox"/>	Utah Emulab	2014-10-04 07:54:53	13 hours, 35 minutes and 59 sec...
<input checked="" type="checkbox"/>	ion.internet2.edu		
<input checked="" type="checkbox"/>	iMinds Virtual Wall 2	2014-10-04 07:54:53	13 hours, 35 minutes and 59 sec...

New duration: days, hours, minutes

Your slice currently expires at 2014-10-04 07:54. When necessary, it will automatically be renewed to match the latest authority expiration time.

Preferences



Raw Rspec editing: “support everything”

The screenshot displays the jFed Experimenter Toolkit interface. The window title is "jFed Experimenter Toolkit". The interface is divided into several sections:

- General Tab:** Contains icons for Copy, Paste, Duplicate, Zoom In, Zoom Out, Reset Zoom, Format Code, Search, Search & Replace, Graphical Editor, and Raw Rspec (highlighted).
- Experiment Editor Tab:** The active tab, showing the XML code editor.
- Experiment Controller Tab:** Currently inactive.
- Computing Elements Panel:** Located on the left, it lists various node types: Generic Node, Physical Node, OpenVZ VM, XEN VM, and Virtual Machine.
- Code Editor:** The main area displaying XML code for an RSpec. The code includes namespaces for jFed, jFedBonfire, and xsi, and defines components like "illinois", "server", and "client" with their respective sliver types and locations.
- Status Bar:** At the bottom, it shows "Untitled X" and "gec3".

```
1 <?xml version="1.0" encoding="UTF-8"?><rspec xmlns="http://www.geni.net/resources/rspec/3"
  xmlns:jFed="http://jfed.iminds.be/rspec/ext/jfed/1"
  xmlns:jFedBonfire="http://jfed.iminds.be/rspec/ext/jfed-bonfire/1"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" generated="2014-03-19T11:56:29.379+01:00"
  generated_by="Experimental jFed Rspec Editor" type="request"
  xsi:schemaLocation="http://www.geni.net/resources/rspec/3
  http://www.geni.net/resources/rspec/3/request.xsd">
2   <node client_id="illinois"
  component_manager_id="urn:publicid:IDN+instageni.illinois.edu+authority+cm" exclusive="false">
3     <sliver type name="emulab-xen"/>
4     <jFed:location x="79.0" y="116.0"/>
5     <jFed:nodeDescription>xen-vm</jFed:nodeDescription>
6   </node>
7   <node client_id="server" component_manager_id="urn:publicid:IDN+emulab.net+authority+cm"
  exclusive="true">
8     <sliver type name="raw-pc"/>
9     <jFed:location x="103.0" y="8.0"/>
10    <jFed:nodeDescription>physical-node</jFed:nodeDescription>
11    <interface client_id="node1:if0"/>
12  </node>
13  <node client_id="client" component_manager_id="urn:publicid:IDN+emulab.net+authority+cm"
  exclusive="true">
14    <sliver type name="raw-pc"/>
15    <jFed:location x="413.0" y="10.0"/>
16    <jFed:nodeDescription>physical-node</jFed:nodeDescription>
17    <interface client_id="node2:if0"/>
18  </node>
19  <link client_id="link3">
20    <component_manager name="urn:publicid:IDN+emulab.net+authority+cm"/>
21    <link type name="lan"/>
22    <interface_ref client_id="node1:if0"/>
23    <interface_ref client_id="node2:if0"/>
24  </link>
```

Click and drag the circle to a target node to create a new link.

Debug by looking into API calls

The screenshot displays the 'jFed Calls Overview' application window. On the left, a task list shows 12 tasks, with task 12 'Status of Sliver @ urn:publicid:IDN+emulab.net+authority+cm' selected. The main area is divided into 'Task details' and 'Task calls'.

Task details:

- Name: Create Sliver @ urn:publicid:IDN+instageni.illinois.edu+authority+cm
- State: SUCCESS
- Start Time: Wed Mar 19 11:51:00 CET 2014
- Stop Time: Wed Mar 19 11:52:03 CET 2014
- Duration: 1 minute, 3 seconds and 18 milliseconds
- This task depends on:
 - 5 Get Slice Credential urn:publi
 - 6 Get User SSH Keys
- Tasks depending on this task: (empty box)

Task calls:

- Call: Geni Aggregate Manager API v2 - CreateSliver
- Authority: InstaGENI Illinois
- Server URL: https://boss.instageni.illinois.edu:12369/protoqeni/xmlrpc/am/2.0
- Call start time: Wed Mar 19 11:51:00 CET 2014
- Call stop time: Wed Mar 19 11:51:15 CET 2014
- Duration: (1 minute and 27 seconds ago)
- Save all details: as text... as xml...
- Buttons: HTTP Request, HTTP Reply, XmlRpc Request, XmlRpc Reply, Geni Reply Value, Geni Reply Code & Output, Processed Geni Reply Value, Result Rs
- GeniResponseCode=0 = Success
- Result: XML response showing sliver details for 'emulab-xen' and 'raw-pc' nodes.

```
<rspec xmlns="http://www.geni.net/resources/rspec/3" xmlns:jFed="http://jfed.iminds.be/rspec/ext/jfed/1" xmlns:jFedBonfire="http://jfed.iminds.be/rspec/ext/jfed/1" client_id="illinois" component_manager_id="urn:publicid:IDN+instageni.illinois.edu+authority+cm" exclusive="true">
  <sliver_type name="emulab-xen"/>
  <jFed:location x="79.0" y="116.0"/>
  <jFed:nodeDescription>xen-vm</jFed:nodeDescription>
  <rs:vnode xmlns:rs="http://www.protonet.net/resources/rspec/ext/emulab/1" name="pcvm3-40"> <host name="illinois.gec3.ch-geni-net.instageni.illinois.edu" component_manager_id="urn:publicid:IDN+emulab.net+authority+cm" exclusive="true">
    <sliver_type name="raw-pc"/>
    <jFed:location x="103.0" y="8.0"/>
    <jFed:nodeDescription>physical-node</jFed:nodeDescription>
    <interface client_id="node1:if0"/>
  </node>
  <node client_id="client" component_manager_id="urn:publicid:IDN+emulab.net+authority+cm" exclusive="true">
    <sliver_type name="raw-pc"/>
    <jFed:location x="413.0" y="10.0"/>
    <jFed:nodeDescription>physical-node</jFed:nodeDescription>
    <interface client_id="node2:if0"/>
  </node>
</rspec>
```

Bug report viewer (new)

The screenshot shows a web browser window titled "jFed Bug Report Viewer". The address bar contains the URL: <https://flsmonitor.fed4fire.eu/jfedexperimenter/reports/bugreport-201410222034.xml>. A "Fetch" button is located to the right of the address bar.

Below the address bar is a navigation bar with tabs: "General", "Logged in User Info", "Preferences", "Slices", "Call Logs X", "Debug Logs", and "Connectivity".

The main content area displays the title "Geni Aggregate Manager API v3 - Allocate" with a red error icon on the left and navigation buttons (back, forward, search) on the right.

Below the title, there are buttons for "Save all details: as text..." and "as xml...", followed by the text "Request size (byte): 15645 Reply size(byte): 1077".

A secondary navigation bar contains tabs: "Connection", "HTTP Request", "HTTP Reply", "XmlRpc Request", "XmlRpc Reply", "Geni Reply Value", "Geni Reply Code & Output", "Processed Geni Reply Value", and "ProtoGeni Error Log".

The "Geni Reply Code & Output" tab is active, showing the following XML content:

```
XmlRpc HashTable Received:
{
  "output": "lan0: No stitching path to host1",
  "code": {
    "protogeni_error_url": "https://www.geni.kettering.edu/spewlogfile.php3?logfile=14d4ac890be667926b015376b85ef3dc",
    "protogeni_error_log": "urn:publicid:IDN+geni.kettering.edu+log+14d4ac890be667926b015376b85ef3dc",
    "am_type": "protogeni",
    "geni_code": 2,
    "am_code": 2
  }
  "value": 0
}
```

At the bottom left, there is a "Save..." button and a small icon.

www.exogeni.net/status



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Status

Important notices are sent via [Twitter](#) (see sidebar or subscribe to our feed).

Check Rack Status (via jFed)

Note that tests run periodically (once every few hours), so may not reflect the most recent state of the rack.

- GetVersion status tells if the rack controller is operational
- Free Resources tells if the rack is available, or busy/under maintenance.
- The URLs of rack controllers (for using GENI tools and Flukes) can be found [in the wiki](#).

Exogeni rack name	Ping latency (ms)	GetVersion Status	Free Resources
Orca BBN SM	92.38	ok	3
Orca Duke SM	114.1	ok	3
Orca ExoSM	141.59	ok	24
Orca FIU SM	147.76	ok	3
Orca NICTA SM	322.51	ok	3
Orca OSF SM	161.23	ok	3
Orca RCI SM	113.94	ok	3
Orca SL SM	138.17	ok	3
Orca TAMU SM	158.96	ok	3
Orca UCD SM	186.34	ok	3
Orca UFL SM	158.12	ok	3
Orca UH SM	129.46	ok	3
Orca UMass SM	93.97	ok	not ok
Orca UvA NL SM	5.66	ok	3
Orca WSU SM	138.96	ok	3
Orca WVN SM	110.5	ok	3



jFed experiences with AMv3

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Idea

- Slivers and sliver expiration dates are cleaner in e.g. describe, status

```
geni_rspec: <geni.rspec, RSpec manifest>,
geni_slivers:
[
  {
    geni_sliver_urn: <string>,
    geni_allocation_status: <string>,
    geni_operational_status: <string>,
    geni_expires <dateTime.rfc3339 when the sliver expires from
    geni_error: <optional string. The field may be omitted enti
  },
  ...
],
```

- Our login tests with AMv3 on Virtual Wall were ok

And then...

- For XEN VMs, describe/status/provision return geni_ready too early (raw-pc is okay)
- jFed solution:

force_amv2_describe (listresources)

force_amv2_status

ignore_provision_operational_status

ABAC credential

- CH returns SFA and abac credential
- AMv3 supports sending multiple credentials (?)
- Error: "Credential owner does not match speaksfor target"
- jFed solution:

remove_abac_credential

Surprise: stricter RSpec parsing

- Some request RSpecs that are accepted by the AMv2 implementation are not accepted by the AMv3 implementation
- RSPEC request does not validate error.

```
<sliver_type name="emulab-opensv">  
  <disk_image url="https://www.lan.sdn.uky.edu/image_meta  
</sliver_type>
```

- XSD: indeed

in this schema <http://www.geni.net/resources/rspec/3/request-common.xsd>
this part

```
- <xs:complexType name="DiskImageContents">  
  <xs:group ref="rspec:AnyExtension"/>  
  <xs:attributeGroup ref="rspec:AnyExtension"/>  
  <xs:attribute name="name" use="required"/>  
  <xs:attribute name="url"/>  
  <xs:attribute name="os"/>  
  <xs:attribute name="version"/>  
  <xs:attribute name="description"/>  
</xs:complexType>
```


TCP connections (AMv2 and AMv3)

- Now and then: "Could not verify user certificate chain"
- jFed solution: retry the call in a new TCP connection

Very recent (like during demo night 😊)

AMv3 provision is okay, AMv3 allocate gives:

Output: No allocated slivers exist

```
-----  
openssl x509 failed to parse certificate  
Could not get target certificate from  
string
```

AMv2 is okay

How we work around

- <https://flsmonitor.fed4fire.eu/testbeds.xml> describes testbeds and types

```
<type name="instageni">
  <special>force_amv2_describe</special>
  <special>force_amv2_status</special>
  <special>ignore_provision_operational_status</special>
  <special>remove_abac_credential</special>
</type>
  <!-- for exogeni, always use the top level authority. References: FEDIBBTDEV
<type name="orca">
  <special>prefer_toplevel_over_subauthority</special>
</type>
<authority xmlns="http://jfed.iminds.be/authority">
  <urn>urn:publicid:IDN+wall1.ilabt.iminds.be+authority+cm</urn>
  <hrn>iMinds Virtual Wall 1</hrn>
  <urls>
    <serverurl>
      <servertime role="Slice Authority" version="1"/>
      <url>https://www.wall1.ilabt.iminds.be/protogeni/xmlrpc/sa</url>
    </serverurl>
    <serverurl>
      <servertime role="Aggregate Manager" version="3"/>
      <url>https://www.wall1.ilabt.iminds.be:12369/protogeni/xmlrpc/am/3.0</url>
    </serverurl>
    <serverurl>
```

Links

- <http://jfed.iminds.be>
- <http://monitor.ilabt.iminds.be>
- <https://flsmonitor.fed4fire.eu/testbeds.xml>
- <http://www.exogeni.net/status>