



Meta hosting in DARIAH-DE (M 2.2.1)

Version 21.11.2016
Cluster 2.2
Responsible Partner GWDG

DARIAH-DE: Transferring Research Infrastructures for the e-Humanities in the Operational Phase

This research and development project is / was funded by the German Federal Ministry of Education and Research (BMBF), fund number 01UG1610A to J, and managed by the Project Management Agency of the German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt, PT-DLR).

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Project: DARIAH-DE: Transferring Research Infrastructures for the e-Humanities in the Operational Phase

BMBF Fund number: 01UG1610A to J

Duration: March 2016 till February 2019

Document status: Final

Dissemination level: Public

Authors:

Xi Kong, GWDG

Revisions:

Date	Author	Comment



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1. Introduction

This document describes the status of the DARIAH-DE meta hosting¹ service, which is deployable, portable, reviewable and sharable². A user manual of the DARIAH-DE meta hosting service is available that provides a step by step guide for users to exploit this service.

The document is transferred from the internal DARIAH wiki pages to have an official public version of the DARIAH meta hosting service. And the internal DARIAH wiki pages will be maintained continuously for the extension of the service for its ease of use and maintenance.

2. Meta hosting as a DARIAH-DE service

2.1. Existing features

- The meta hosting service is available in the GWDG portal.
- There is a dedicated VM for each container containing user needed specific API.
- Example meta hosting services are available as single images in the GWDG compute cloud.
 - eXist³, Voyant⁴ and Neo4j⁵ are available for the time being.
- Currently, manual activation and only for registered GWDG users.

2.2. Future extension

- VM image with web interface and the option of multiple containers for users within the VM.
- With the further development of the GWDG-AAI, the release is also possible for DARIAH users.

¹ See also: Sharing software in a distributed infrastructure. <http://ieeexplore.ieee.org/document/7160268/>

² https://wiki.de.dariah.eu/display/DARIAH2/Metahosting-Workshop?preview=/39324449/40436379/rybicki_metahosting.pdf

³ <http://www.exist-db.org/>

⁴ <https://voyant-tools.org/>

⁵ <https://neo4j.com/>

3. User manual of the DARIAH-DE meta hosting

To use an existing DARIAH-DE meta hosting service, the user should follow three steps.

- Step 1: Users authenticate.
- Step 2: Create a server, which contains the container with needed API. Firewall rules should be defined in this step, and this is API specific configuration.
- Step 3: Connect with the APIs and setup the API specific settings, primarily user authentication.

In this manual, we demonstrate three existing DARIAH-DE meta hosting services, i.e., eXist, Voyant and Neo4j, as examples.

3.1. Step 1: Users authenticate

To use the service, users need to log into the GWDG Portal⁶ to have their credentials authenticated.

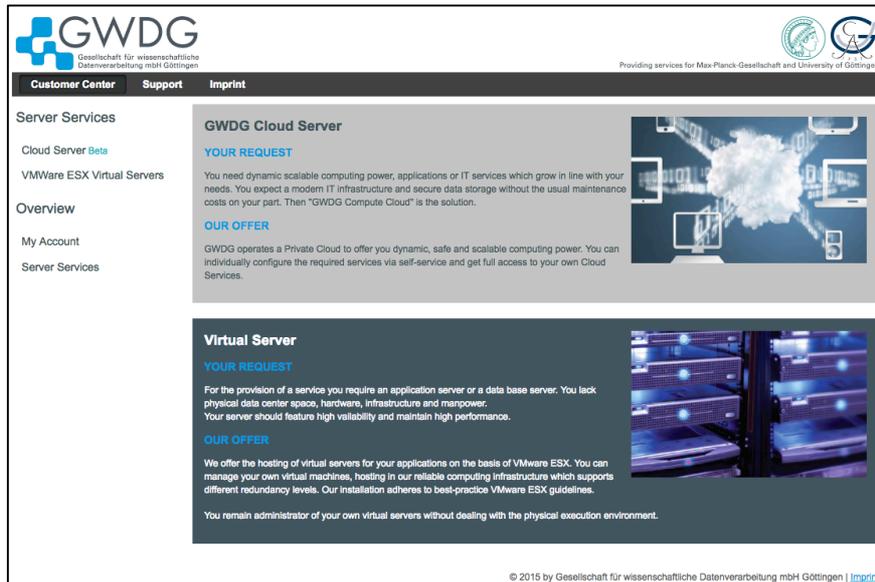
Use your username or e-mail address and password to log into the GWDG Portal.

The screenshot shows the GWDG Portal login interface. At the top left is the GWDG logo with the text 'Gesellschaft für wissenschaftliche Datenverarbeitung mbH Göttingen'. To the right are logos for the Max-Planck-Gesellschaft and the University of Göttingen, with the text 'Providing services for Max-Planck-Gesellschaft and University of Göttingen'. Below this is a navigation bar with 'Customer Center', 'News', 'Support', and 'Imprint'. The main content area has a 'Login' section with input fields for 'Email Address / Username' and 'Password', a 'Stay signed in' checkbox, and a 'Login' button. A red 'Note' section follows, stating: 'Since the update of our website on 10/20/2015 the Self Service is no longer accessible through this portal. For password change, etc. please use <https://www.gwdg.de>'. Below that is a 'Cloud Server' section with the text: 'For an interim phase you can still access the Cloud Server service using this website.' The footer at the bottom right reads: '© 2015 by Gesellschaft für wissenschaftliche Datenverarbeitung mbH Göttingen | [Imprint](#)'.

⁶ <https://portal.gwdg.de>

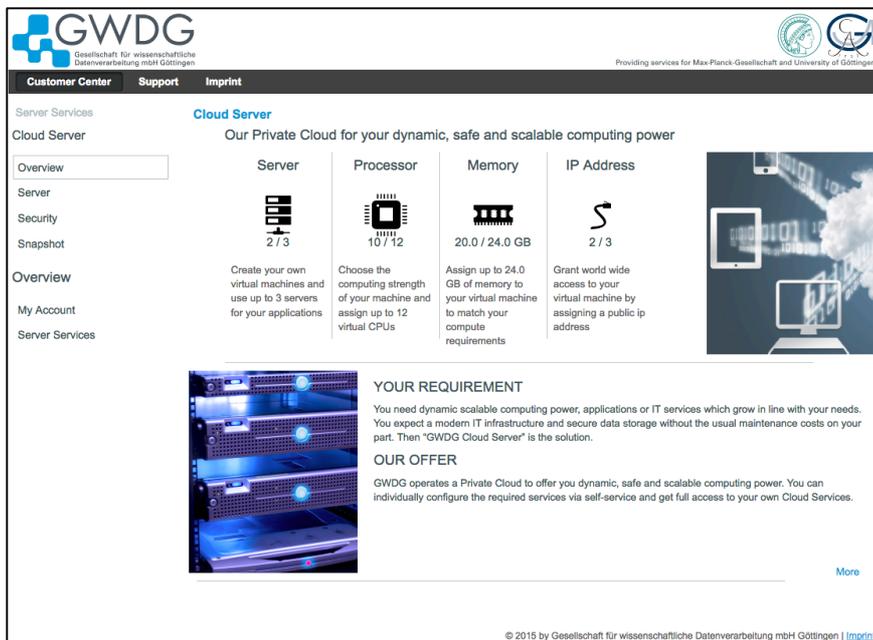
3.2. Step 2: Create server

1. Go to the menu "Server Services".



The screenshot shows the GWGD website interface. At the top left is the GWGD logo with the text 'Gesellschaft für wissenschaftliche Datenverarbeitung mbH Göttingen'. To the right are logos for the Max-Planck-Gesellschaft and the University of Göttingen, with the text 'Providing services for Max-Planck-Gesellschaft and University of Göttingen'. Below the logo is a navigation bar with 'Customer Center', 'Support', and 'Imprint'. The main content area is titled 'Server Services' and includes a sidebar with 'Cloud Server Beta', 'VMWare ESX Virtual Servers', 'Overview', 'My Account', and 'Server Services'. The main content area has two sections: 'GWGD Cloud Server' and 'Virtual Server'. Each section has a 'YOUR REQUEST' and 'OUR OFFER' subsection. The 'GWGD Cloud Server' section includes an image of a cloud with server icons. The 'Virtual Server' section includes an image of server racks. At the bottom right, there is a copyright notice: '© 2015 by Gesellschaft für wissenschaftliche Datenverarbeitung mbH Göttingen | Imprint'.

2. Go to the menu "Cloud Server Beta".



The screenshot shows the GWGD website interface for the 'Cloud Server Beta' configuration page. At the top left is the GWGD logo with the text 'Gesellschaft für wissenschaftliche Datenverarbeitung mbH Göttingen'. To the right are logos for the Max-Planck-Gesellschaft and the University of Göttingen, with the text 'Providing services for Max-Planck-Gesellschaft and University of Göttingen'. Below the logo is a navigation bar with 'Customer Center', 'Support', and 'Imprint'. The main content area is titled 'Cloud Server' and includes a sidebar with 'Overview', 'Server', 'Security', 'Snapshot', 'Overview', 'My Account', and 'Server Services'. The main content area has a header 'Our Private Cloud for your dynamic, safe and scalable computing power' and a table with four columns: 'Server', 'Processor', 'Memory', and 'IP Address'. Each column has an icon and a value. Below the table is a 'YOUR REQUIREMENT' section with an image of server racks and a 'YOUR OFFER' section. At the bottom right, there is a 'More' link and a copyright notice: '© 2015 by Gesellschaft für wissenschaftliche Datenverarbeitung mbH Göttingen | Imprint'.

Server	Processor	Memory	IP Address
2 / 3	10 / 12	20.0 / 24.0 GB	2 / 3
Create your own virtual machines and use up to 3 servers for your applications	Choose the computing strength of your machine and assign up to 12 virtual CPUs	Assign up to 24.0 GB of memory to your virtual machine to match your compute requirements	Grant world wide access to your virtual machine by assigning a public ip address

3. Go to the menu "Server"

The screenshot shows the GWDDG 'Manage Server' interface. At the top left is the GWDDG logo (Gesellschaft für wissenschaftliche Datenverarbeitung mbH Göttingen). At the top right are logos for the Max-Planck-Gesellschaft and University of Göttingen, with the text 'Providing services for Max-Planck-Gesellschaft and University of Göttingen'. Below the logos is a navigation bar with 'Customer Center', 'Support', and 'Imprint'. The main content area is titled 'Server Services' and 'Manage Server'. It contains a table with two rows of server information:

Server	IP	OS	Status
Neo4j	141.5.103.29	DARIAH Neo4j v3.0	ACTIVE
test-large	141.5.103.30	Ubuntu 14.04 LTS Server x86_64	ACTIVE

Below the table is a '+ ' button to create a new server. On the left side, there is a navigation menu with items: 'Server Services', 'Cloud Server', 'Overview', 'Server', 'Security', 'Snapshot', 'Overview', 'My Account', and 'Server Services'. The 'Server' item is highlighted. At the bottom right, there is a copyright notice: '© 2015 by Gesellschaft für wissenschaftliche Datenverarbeitung mbH Göttingen | Imprint'.

4. Click the "+" button to create the server.

This screenshot is identical to the one above, showing the GWDDG 'Manage Server' interface. The table of servers and the '+ ' button are visible. The navigation menu on the left is also present. The copyright notice at the bottom right reads: '© 2015 by Gesellschaft für wissenschaftliche Datenverarbeitung mbH Göttingen | Imprint'.

5. Select the VM needed, e.g. size, and then click **“Next”**.

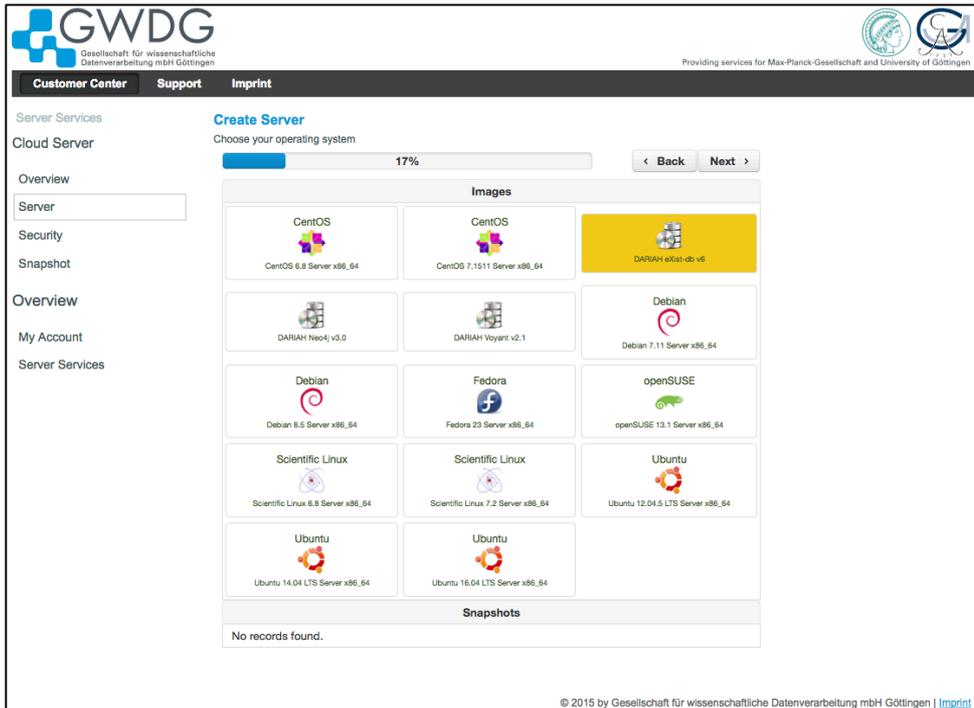
The screenshot shows the GWDG 'Create Server' interface. The page title is 'Create Server' and the subtitle is 'Choose your virtual machine for creation'. A progress bar shows 0% completion. A 'Next >' button is visible. The interface is divided into a left sidebar and a main content area. The sidebar includes links for 'Server Services', 'Cloud Server', 'Overview', 'Server', 'Security', 'Snapshot', 'Overview', 'My Account', and 'Server Services'. The main content area displays three categories of VMs: 'General', 'Memory optimized', and 'Compute optimized'. Each category contains several VM options with their respective specifications (Cores, RAM, and Disk). The 'm1.medium' option in the 'General' category is highlighted in yellow.

Category	VM Type	Cores	RAM	Disk
General	m1.micro	1	256 MB	0 MB
	m1.tiny	1	512 MB	0 MB
	m1.small	1	2 GB	20 GB
	m1.medium	2	4 GB	40 GB
	m1.large	4	8 GB	80 GB
General (continued)	m1.xlarge	8	16 GB	160 GB
	m1.xxlarge	8	32 GB	160 GB
Memory optimized	m2.small	1	4 GB	20 GB
	m2.medium	2	8 GB	40 GB
	m2.large	4	16 GB	80 GB
	m2.xlarge	4	32 GB	160 GB
	m2.xxlarge	8	64 GB	160 GB
Compute optimized	c1.small	2	2 GB	20 GB
	c1.medium	4	4 GB	40 GB
	c1.large	8	8 GB	80 GB
	c1.xlarge	16	16 GB	160 GB
	c1.xxlarge	16	32 GB	160 GB

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6. Select the image to be created:

- a. DARIAH eXist-db v6
- b. DARIAH Neo4j v3.0 or
- c. DARIAH Voyant v2.1, and click **“Next”**.

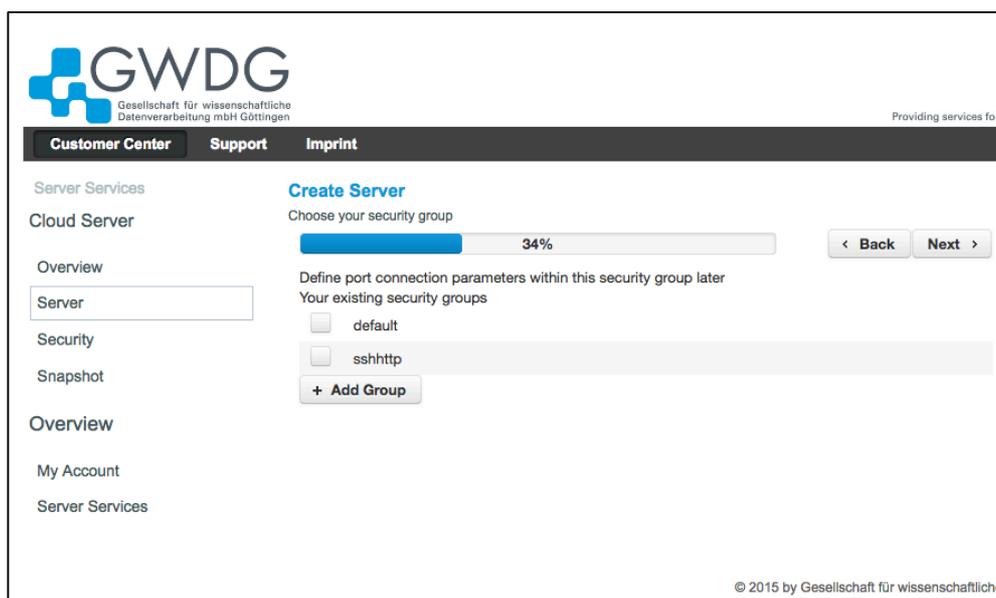


7. Security settings/Define the firewall rules

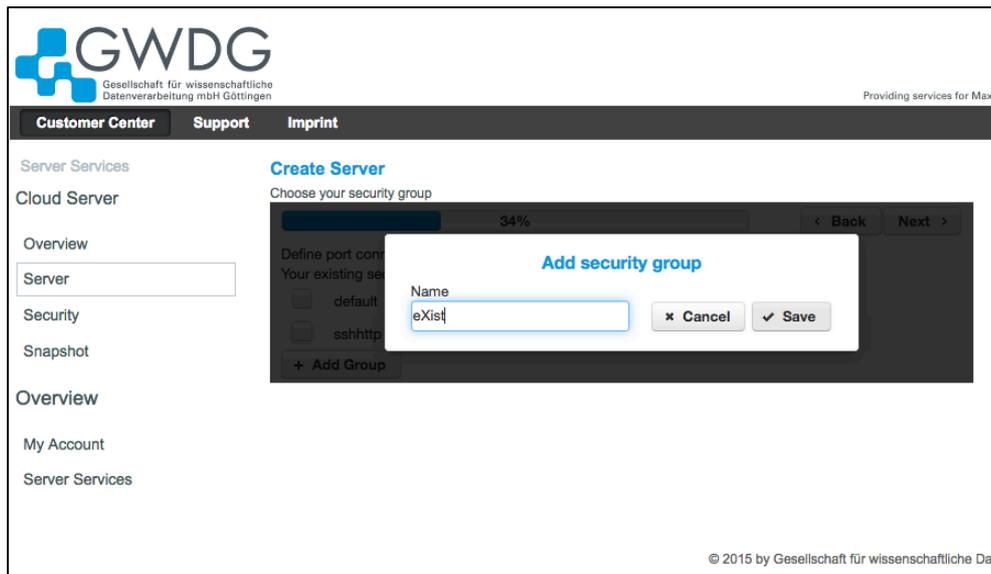
The firewall rules should be defined for each API in this step. Different APIs have different security requirements, please check the documentation of the API if you are not sure what rules should be applied. Here we demonstrate the basic setting for the APIs **eXist**, **Voyant** and **Neo4j**.

7.1. Select existing firewall rules or add new security group.

7.2. In this demonstration, we “**Add Group**” for eXist.

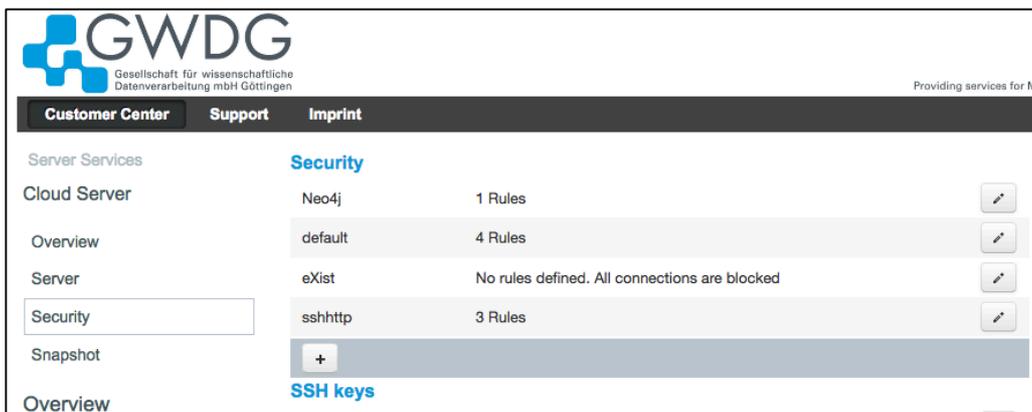


7.3. Assign a new security group named “eXist” and “save”.

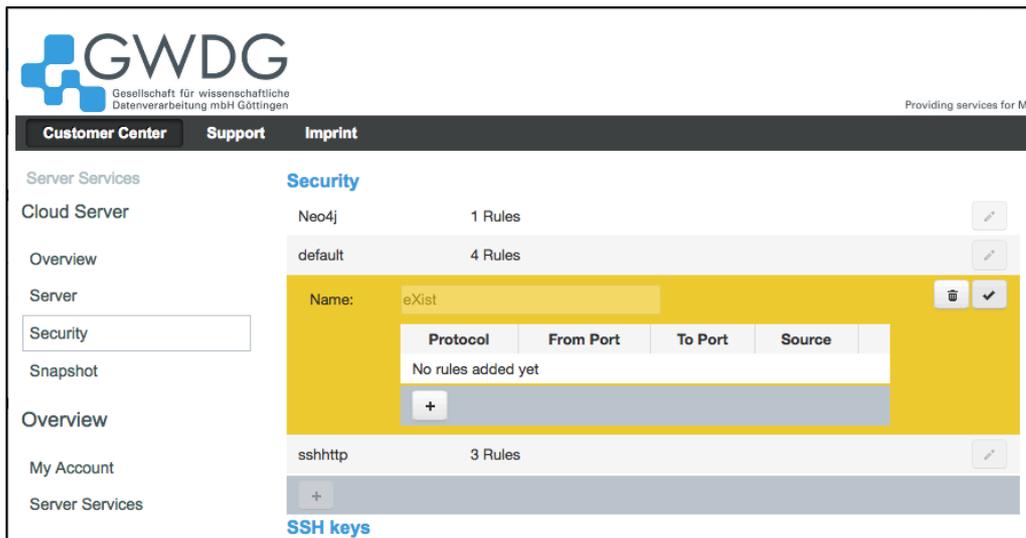


7.4. Go to “**Security**” and edit the new created security group “eXist”.

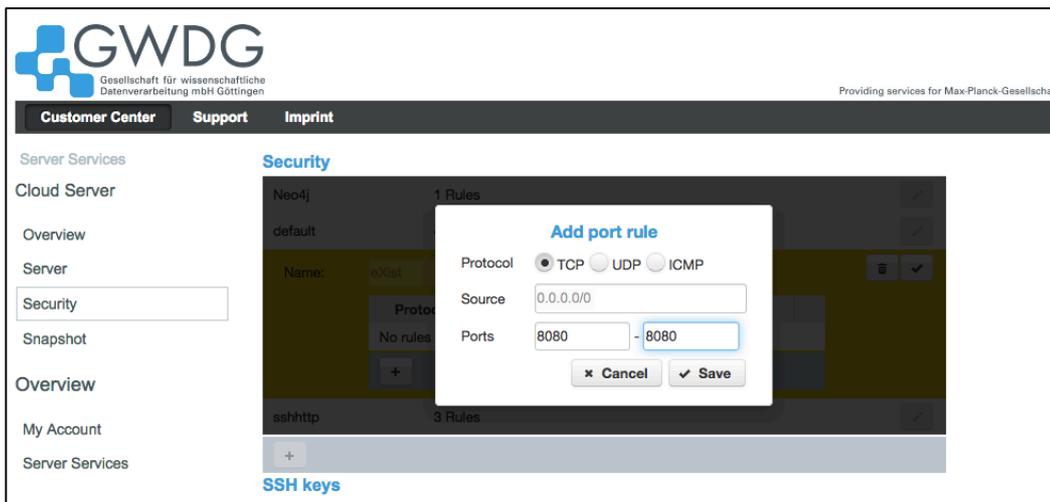
Until now no rules defined yet for eXist. All connections are blocked. Click  to edit rules for eXist.



7.5. Click “+” to add a rule for eXist.



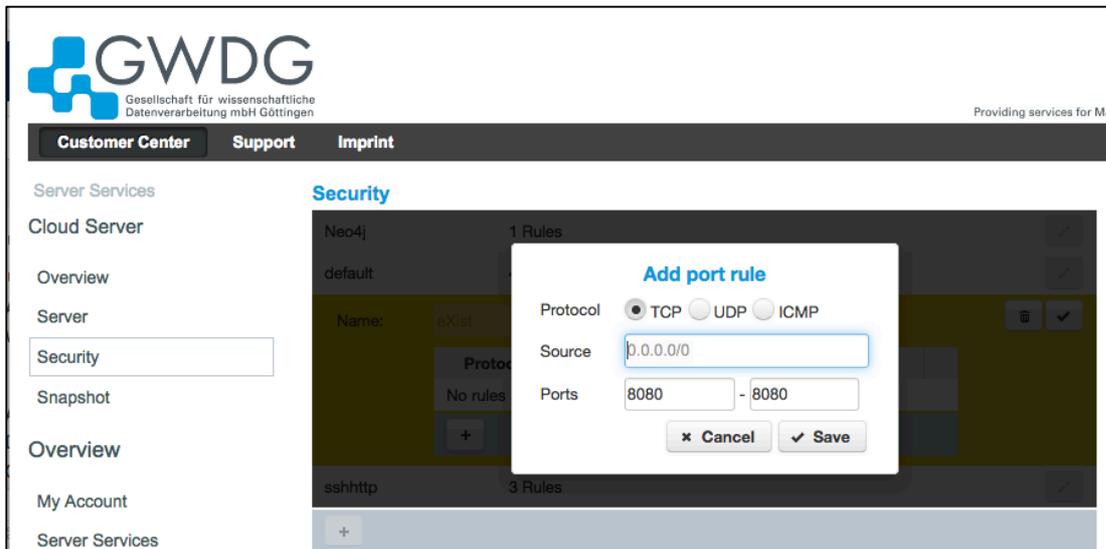
7.6. Port **8080** should be open for eXist. A single IP address or a range of subnet, where the API should be accessed can be assigned by “source”. Click “save” to save the rules.



7.7. We’ve now defined a security rule for eXist.
In this example the eXist can be accessed from the GWDG network.

Firewall rules for Voyant

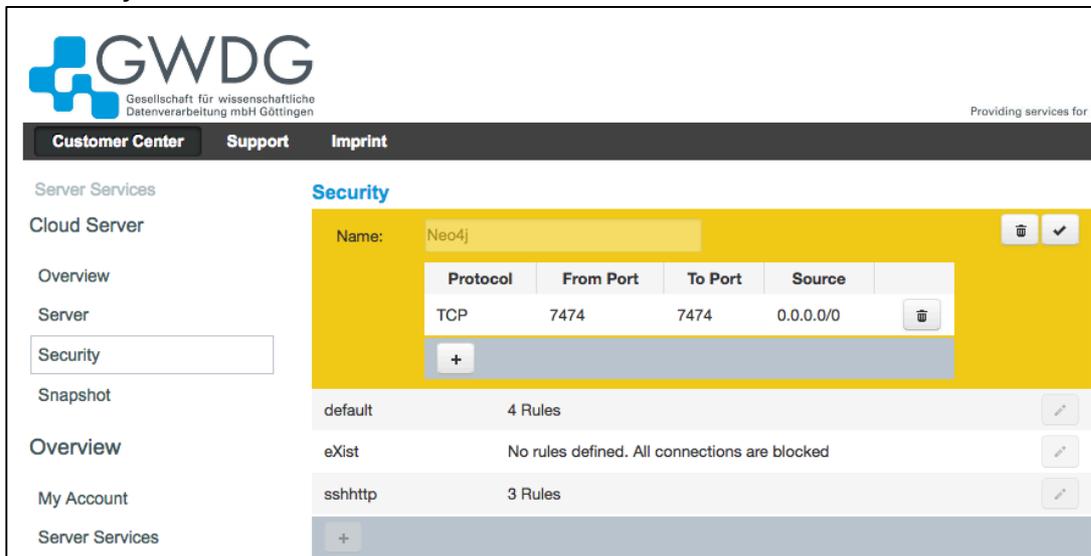
Please go through the steps of “Security settings”, 7.1-7.7. Similar to eXist the port **8080** should be opened for Voyant.



The screenshot shows the GWDDG web interface. The left sidebar contains navigation options: Server Services, Cloud Server, Overview, Server, Security (selected), Snapshot, Overview, My Account, and Server Services. The main content area is titled 'Security' and shows a list of services: Neo4j (1 Rule), default, eXist (No rules), and sshhttp (3 Rules). A modal dialog titled 'Add port rule' is open over the Neo4j service. The dialog contains the following fields: Protocol (radio buttons for TCP, UDP, ICMP, with TCP selected), Source (text input field containing 0.0.0.0/0), and Ports (text input field containing 8080 - 8080). There are 'Cancel' and 'Save' buttons at the bottom of the dialog.

Firewall rules for Neo4j

Go through the steps of “Security settings”, 7.1-7.7. The port 7474 should be opened for Neo4j.



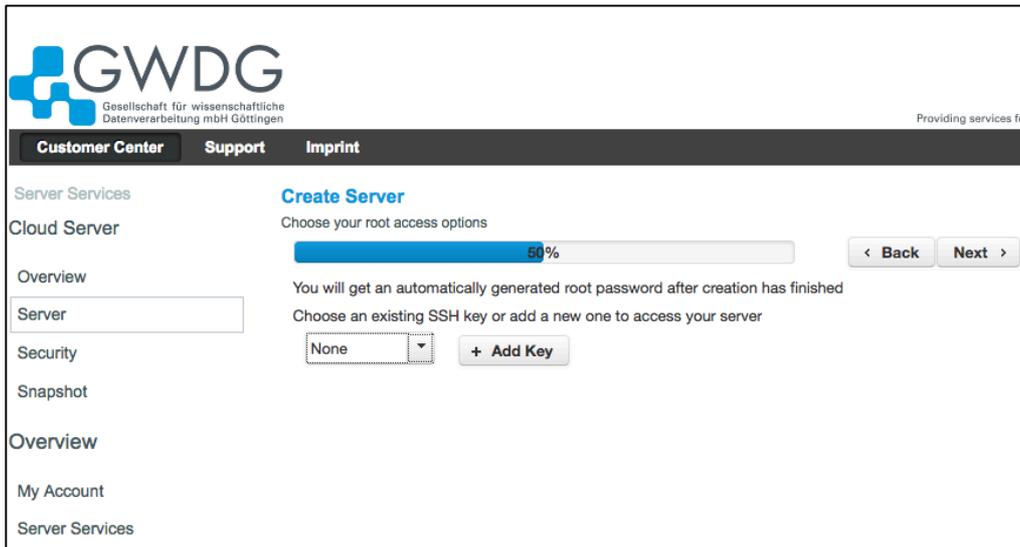
The screenshot shows the GWDDG web interface. The left sidebar is the same as in the previous screenshot. The main content area is titled 'Security' and shows a list of services: Neo4j (1 Rule), default (4 Rules), eXist (No rules defined. All connections are blocked), and sshhttp (3 Rules). The 'Neo4j' service is highlighted in yellow. A table shows the rule for Neo4j:

Protocol	From Port	To Port	Source
TCP	7474	7474	0.0.0.0/0

There is a '+' button below the table to add more rules. The 'default' service has 4 rules, 'eXist' has no rules, and 'sshhttp' has 3 rules.

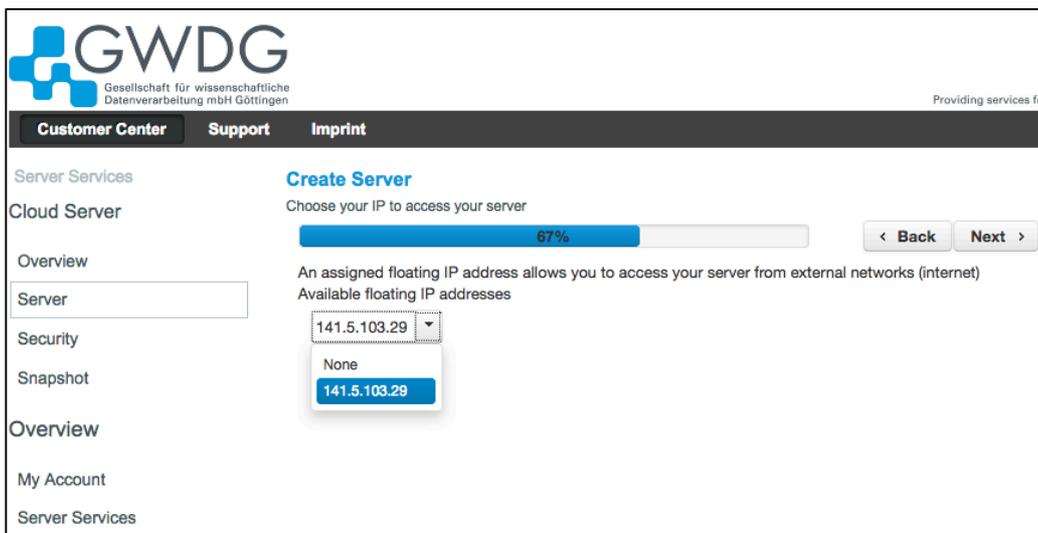
Further steps to create a server

8. After setting up the security rules, click **“Next”**. An automatically generated root password will be created.



The screenshot shows the GWDG 'Create Server' wizard. The progress bar is at 50%. The current step is 'Choose your root access options'. Below the progress bar, there is a text box for an automatically generated root password and a dropdown menu set to 'None' with an '+ Add Key' button. The left sidebar shows a navigation menu with 'Server' selected.

9. Assign an IP address for the server, which allows you to access your server from external networks/internet. And click **“Next”**.



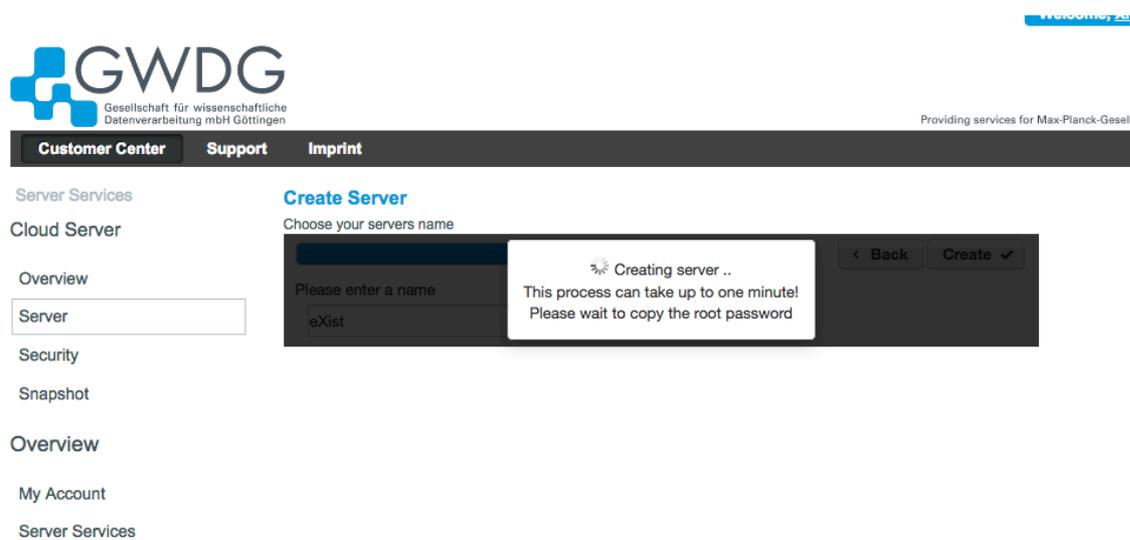
The screenshot shows the GWDG 'Create Server' wizard. The progress bar is at 67%. The current step is 'Choose your IP to access your server'. Below the progress bar, there is a text box explaining that an assigned floating IP address allows access from external networks. A dropdown menu shows '141.5.103.29' selected, with a 'None' option and a button to confirm the selection. The left sidebar shows a navigation menu with 'Server' selected.

10. Assign a name for the server and click "Create".



The screenshot shows the GWDG 'Create Server' interface. At the top left is the GWDG logo with the text 'Gesellschaft für wissenschaftliche Datenverarbeitung mbH Göttingen'. To the right, it says 'Providing services for'. Below the logo is a navigation bar with 'Customer Center', 'Support', and 'Imprint'. The main content area is titled 'Create Server' and includes a progress bar at 84%. Below the progress bar is a text input field with the name 'eXist' and a 'Create' button with a checkmark. On the left side, there is a sidebar with 'Server Services' and 'Cloud Server' sections, including links for 'Overview', 'Server', 'Security', and 'Snapshot'. At the bottom of the sidebar are 'My Account' and 'Server Services'.

11. The server will be created. This process can take some minutes. Please wait to **write down** and **save** the root password.



The screenshot shows the GWDG 'Create Server' interface with a progress bar at 100%. A modal dialog box is displayed in the center, containing the text: 'Creating server .. This process can take up to one minute! Please wait to copy the root password'. The background is dimmed, and the 'Create' button is still visible. The sidebar and navigation elements are the same as in the previous screenshot.

12. The server is created. Click **“Finish”**.

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Customer Center Support Imprint

Server Services **Create Server**
Your server is available now

Cloud Server

Overview

Server

Security

Snapshot

Overview

My Account

Server Services

Server created Unable to attach Floating IP

100%

Create New Finish

Please copy your new root password to access your server

Password [REDACTED]

Name eXist

Operating System DARIAH eXist-db v6

Virtual Machine m1.medium

Security Group eXist

IP Address 141.5.103.29

SSH Key none

13. Please note the message showed in this example of step 12, “Server created unable to attach Floating IP”. In this case, go to **“Server”** and **edit** the created server “eXist”.

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Customer Center Support Imprint

Server Services **Manage Server**

Cloud Server

Overview

Server

Security

Snapshot

eXist		DARIAH eXist-db v6	ACTIVE
Voyant	141.5.103.28	DARIAH Voyant v2.1	ACTIVE
test-large	141.5.103.30	Ubuntu 14.04 LTS Server x86_64	ACTIVE

+

14. Manually attach the IP again. Select the IP address and click “✓”.

The screenshot shows the GWDG 'Manage Server' interface. The main content area is highlighted in yellow and displays the following details for the server 'eXist':

- Name: eXist
- Public IP: 141.5.103.28
- Internal IP: 10.254.1.2
- Security Group: eXist [Change](#)
- Type: m1.medium
- Image: DARIAH eXist-db v6
- Updated: Mon Oct 31 16:37:32 CET 2016

On the right side, there are control buttons: 'View', 'Snapshot', 'Reboot', and 'Suspend'. The server status is 'ACTIVE'. Below this, a table lists other servers:

Server Name	Public IP	Image	Status
Voyant	141.5.103.28	DARIAH Voyant v2.1	ACTIVE
test-large	141.5.103.30	Ubuntu 14.04 LTS Server x86_64	ACTIVE

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15. The server is updated and the IP address is attached successfully.

The screenshot shows the GWDG 'Manage Server' interface after an update. The server list is now:

Server Name	Public IP	Image	Status
eXist	141.5.103.29	DARIAH eXist-db v6	ACTIVE
Voyant	141.5.103.28	DARIAH Voyant v2.1	ACTIVE
test-large	141.5.103.30	Ubuntu 14.04 LTS Server x86_64	ACTIVE

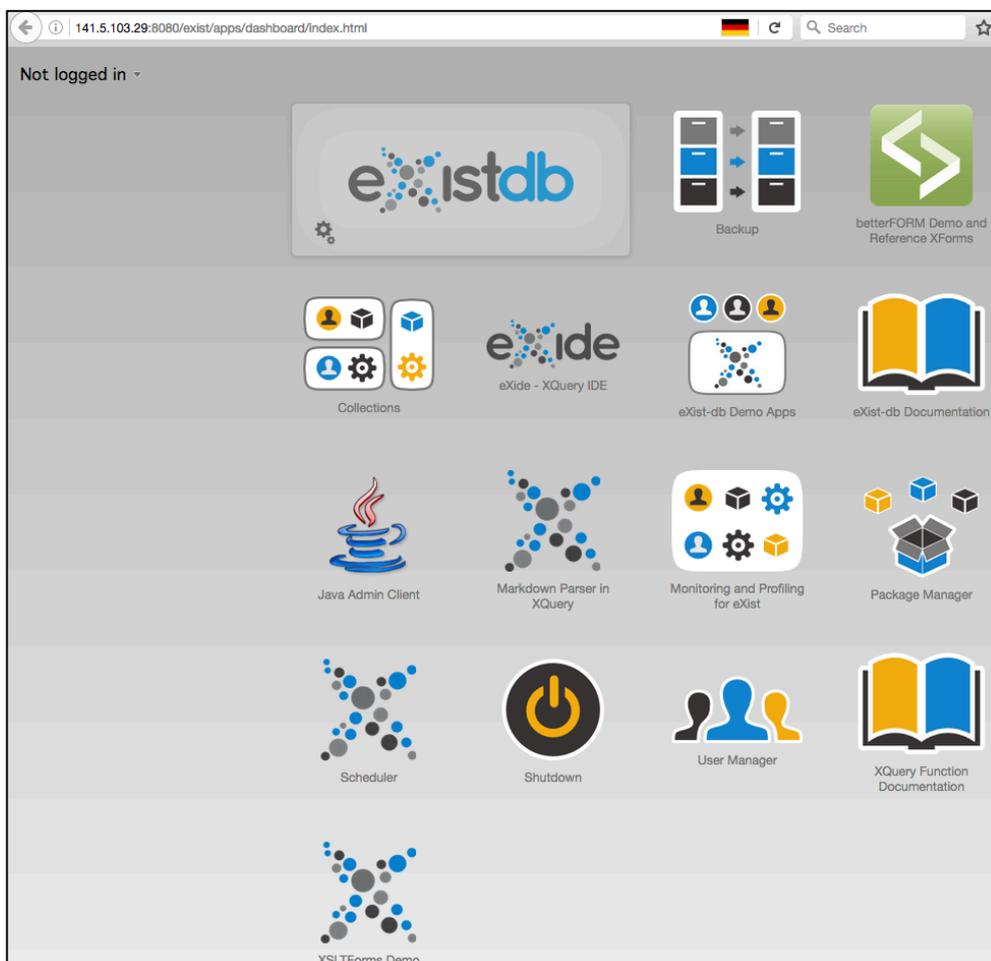
The footer contains the copyright notice: © 2015 by Gesellschaft für wissenschaftliche Datenverarbeitung mbH Göttingen | [Imprint](#)

3.3. Step 3: Connect with the APIs and setup the API specific settings

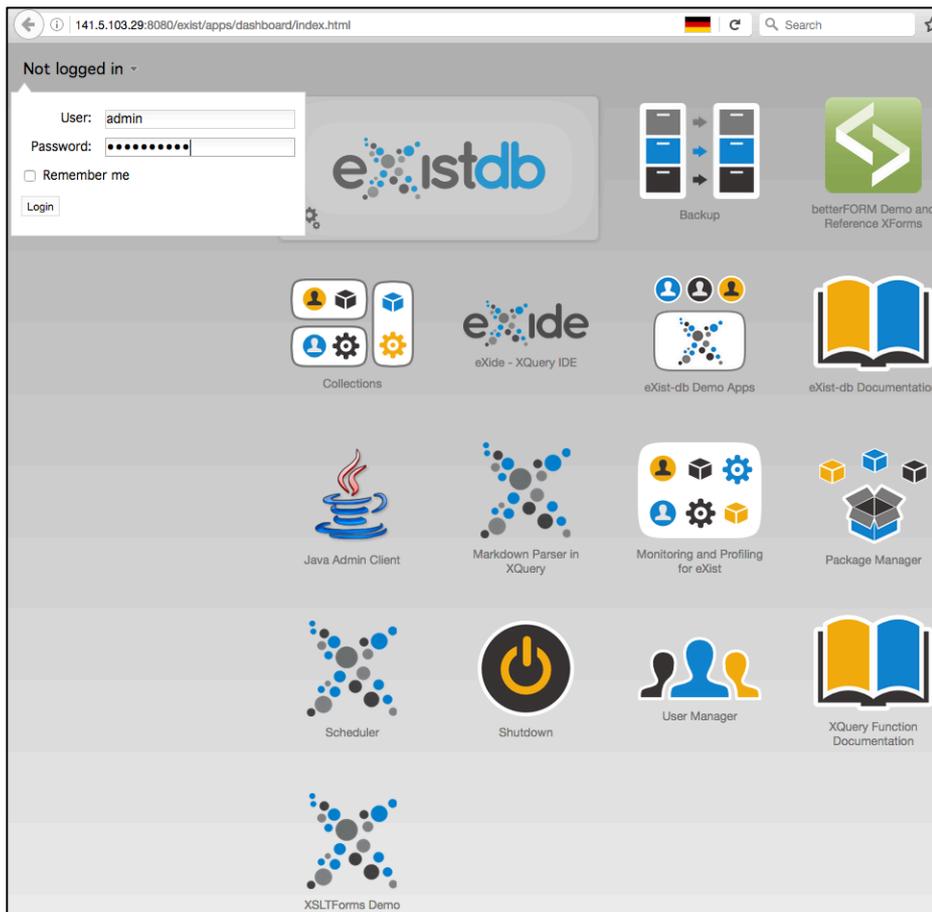
The server with the container containing eXist is now ready to use. But before you start using the API, some API specific setting should be configured. In this user manual, we show the setup related to meta hosting. For other features of the API, please look up the related API documents.

3.3.1. API specific settings of eXist

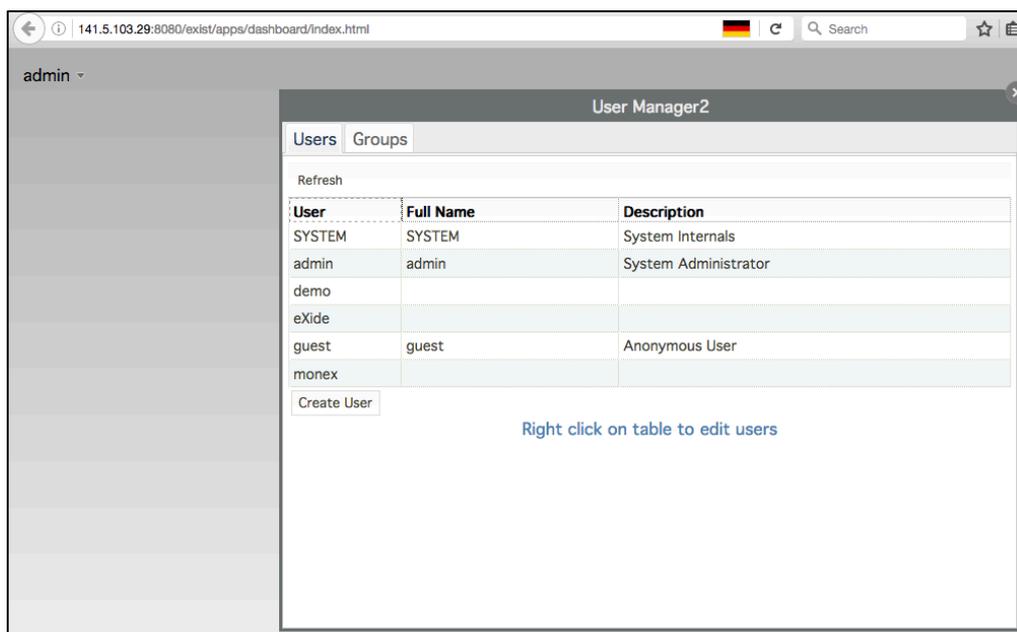
1. Open a browser and go to [IP Address : Port], in this example:
<http://141.5.103.29:8080>



- Go to “User Manager”, and log in with the initial set up.
User: admin, Password: Dariah2016. Click “Login”.



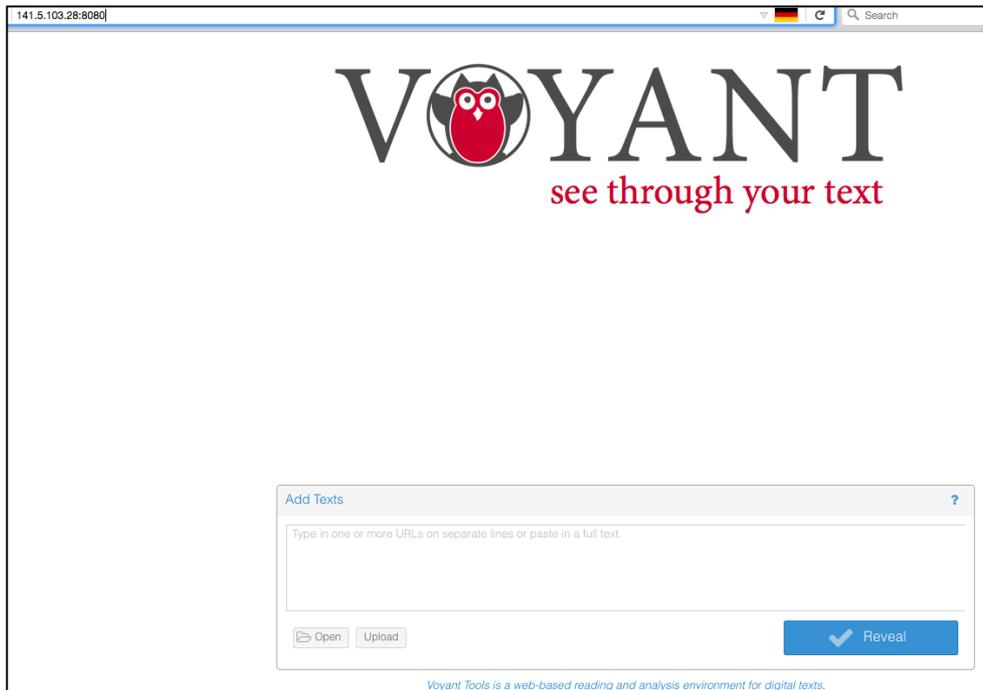
- Now, you can change the password and manage user permissions.



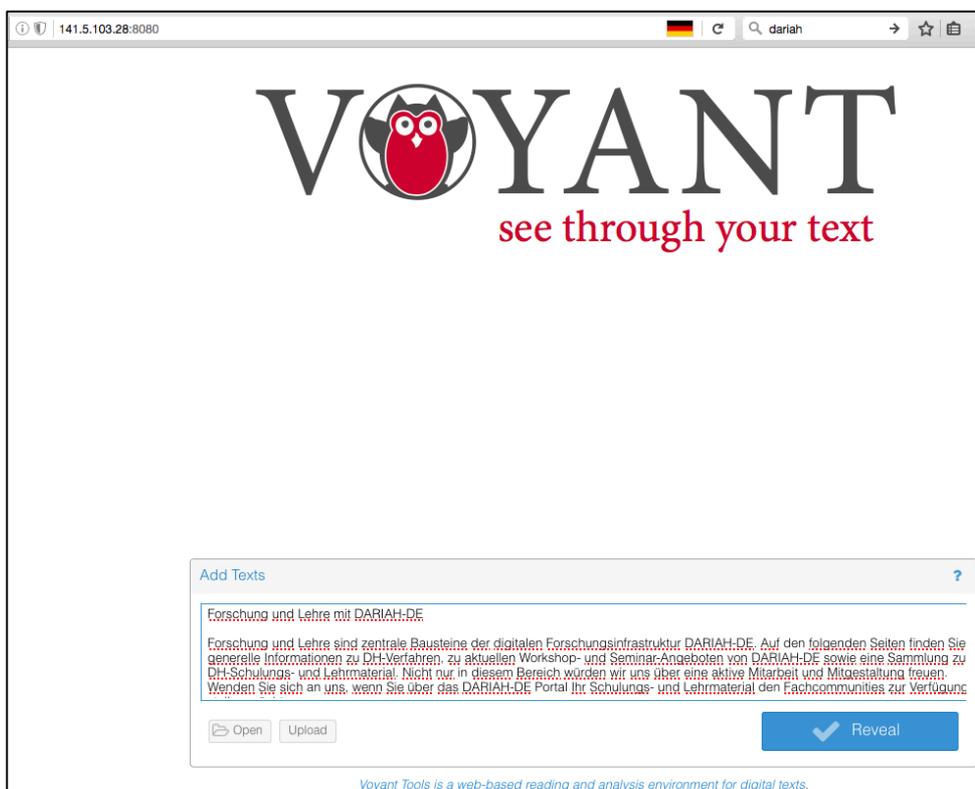
- Enjoy:-)

3.3.2. API specific settings of Voyant

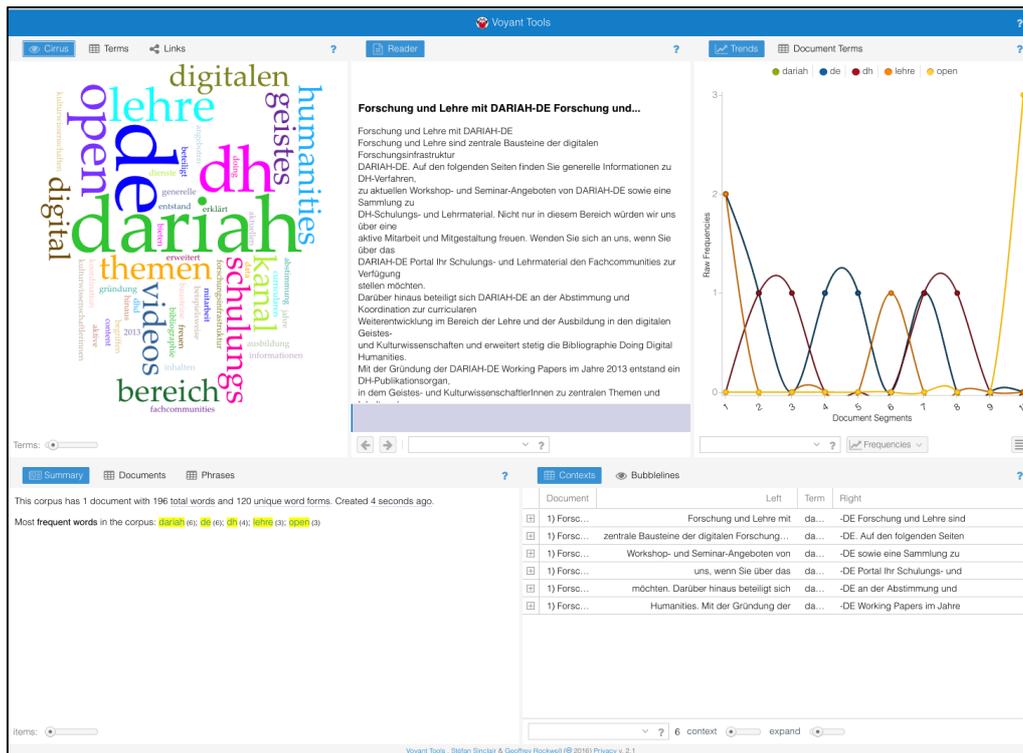
1. Open a browser and go to **[IP Address : Port]**, in this example: <http://141.5.103.28:8080>.



2. Add some texts to reveal.

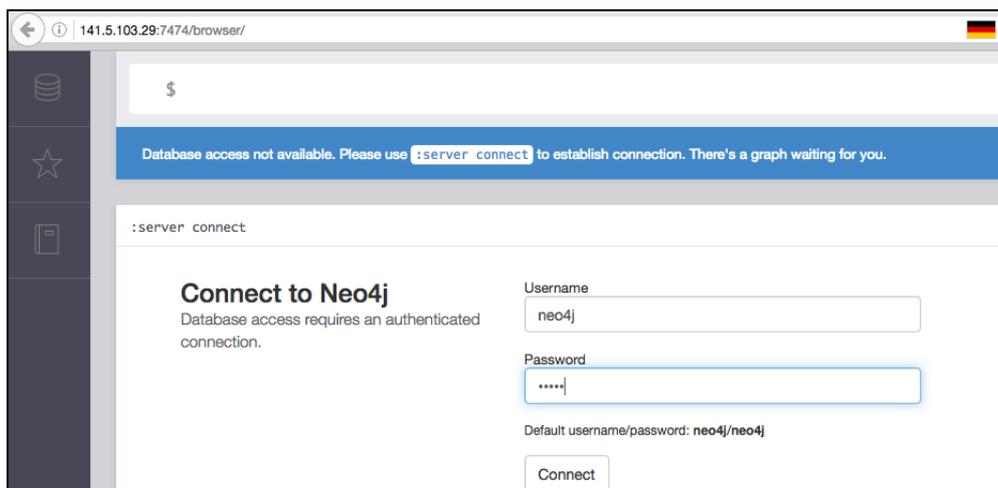


3. Enjoy the result:-)



3.3.3. API specific settings of Neo4j

1. Open a browser and go to [IP Address:7474].
2. Use the default username and password, **neo4j/neo4j**, to connect with Neo4j.



3. You're now connected with Neo4j.

