



Introduction to GeoServer

Tutorial ID: IGET_WEBGIS_003



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Introduction to GeoServer

Objective: In this tutorial we will learn about the GeoServer GUI and how to create the workspaces, stores, publishing, styling and grouping the layers.

Software: OpenGeo Suite 3.0

Level: Beginner

Time required: 4 hours

Prerequisites and Geospatial Skills:

- Basic computer skills
- IGET_WEBGIS_001 and IGET_WEBGIS_002 should be completed

Readings

Introduction to the OpenGeo Suite, Chapter 3: GeoServer, pp. 39-78.

http://presentations.opengeo.org/2012_FOSSGIS/suiteintro.pdf

Tutorial Data: The tutorial data of this exercise may be downloaded from the associated folder



Introduction

GeoServer is an open source web mapping server written in Java platform. It is a subset of a web server model specially designed to share and publishes the Geographical information over the internet. It utilizes Web Mapping Service (WMS), Web Feature Service (WFS), Web Coverage Service (WCS) and many other open protocols for transfer the Geographical information, such as maps, spatial attributes and Feature data sets. Through these protocols GeoServer can serve the data and maps in an efficient and powerful way. GeoServer supports the most common data sources like, Geo Tiff, Shapefile, ArcGrid, JPEG200 and GDAL formats and various databases viz., PostGIS, SQL Server, DB2, Oracle Spatial and ArcSDE.

You are recommended to read the *GeoServer* concepts before proceeding to the exercise from following link: <u>http://workshops.opengeo.org/suiteintro/geoserver/concepts.html</u>

GeoServer Graphic User Interface (GUI)

- 1. Start OpenGeo Suite Dashboard via, Start \rightarrow All Programs \rightarrow OpenGeo Suite 3.0 \rightarrow OpenGeo Suite Dashboard.
- 2. In OpenGeo Suite Dashboard click on 'Start' button to start the server.
- 3. Click on the 'Configure' button in GeoServer column

| 📀 OpenGeo Suite Dashbo | ard | |
|-------------------------|---------------|--|
| | OpenGeo Suite | 3.0 Shutdown |
| Dashboard Components | At a Glance | |
| Logs | Datastores | Import data to PostGIS or GeoServer Manage databases |
| Preferences | Layers | Style layers Edit layers Cache layers |
| Documentation | Maps | Compose maps Recipe Book |
| Getting Started FAQ | Components | |
| About | PostGIS | Manage Import shapefiles About Documentation |
| | GeoServer | 3 Configure Import data About Documentation |
| | GeoWebCache | Configure About Documentation |
| | SeoExplorer | Launch About Documentation |
| | Client SDK | About Tutorial API Documentation |
| | | |
| OpenGeo 🚱 | | |

- 4. Now 'GeoServer: Welcome' page will be opened in your default web browser.
- 5. You need to fill your credentials to login into the *GeoServer* to carry out the configuration tasks. By default the user name and password is '*admin*' and '*geoserver*'. After filling the credentials click on 'Login' button.



6. After successful login, you can notice more options appeared in the GeoServer: Welcome window.

| GEOSERVER | | 6 | Logged in as admin. |
|--|---|--|---|
| About & Status 7ii Server Status GeoServer Logs | Welcom 7i Welcom 7i This GeoServer belongs to | o OpenGeo. | Service Capabilities |
| About GeoServer Data | 23 Layers 8 Stores | Add layers Add stores | WCS 1.0.0 1.1.1 |
| Layer Preview Import Data Workspaces Stores Layers Layer Groups Styles WPS Processes Services WCS WCS WSS WMS WMS WMS WPS | 5 Workspaces 5 Workspaces Please read the file C: afterwards. This file is a set Please remove the file because it contains user p The default user/group The administrator pass highly recommended that No strong cryptograph | Create workspaces Create workspaces Users\Abhijit\.opengeo\data_dir\security\masterpw.info and remove it ecurity risk. C:\Users\Abhijit\.opengeo\data_dir\security\users.properties.old basswords in plain text. This file is a security risk. service should use digest password encoding. sword for this server has not been changed from the default. It is you change it now. Change it y available, installation of the unrestricted policy jar files is | ULT WFS 1.0.0 1.1.0 2.0.0 WMS 1.1.1 1.3.0 WPS 1.0.0 TMS 1.0.0 WMS-C 1.1.1 WMTS 1.0.0 |
| Settings ③ Global ③ JAI ⑤ Coverage Access <i>P</i> Proxy | recommended This GeoServer instance is contact the administrator. | s running version 2.2-SNAPSHOT . For more information please | |

- 7. The GUI of the GeoServer: Welcome window is divided into 2 main parts
 - i. *Main Panel* (shown in the orange box): It contains the information that corresponds to the selected option from the navigation panel.
 - ii. *Navigation Panel* (show in green box): Navigation panel is further grouped into following groups.

| a. | About & Status | f. | Security |
|----|----------------|----|-----------|
| b. | Data | g. | Scripting |
| c. | Services | h. | Demos |
| d. | Settings | i. | Tools |
| e. | Tile Caching | | |



We will learn each of the above the groups in detail as we move further

Creating a workspace

A *workspace* is the name for a notional container used to group similar data together. A workspace consists of a Name and a Namespace URI (*Uniform Resource Identifier*). The workspace name should not contain any spaces.

8. In the navigation panel of 'GeoServer: Welcome' page, click on 'Workspaces'



9. Now you will be redirect to the 'GeoServer: Workspaces' page. In order to create a workspace, click on 'Add new workspace' under Workspace in Main Panel.

| 🚯 GeoServer: Workspaces | + | | |
|---|--|---------------------|-------------|
| ♦ ♦ ♥ Ocalhost:8080/geose | rver/web/?wicket:bookmarkablePage=:org.geoserver.web.data.workspace.WorkspacePage | | ☆ マ C 8 - G |
| GeoServer | | Logged in as admin. | Logout |
| | Workspaces | | |
| About & Status Server Status GeoServer Logs Contact Information | Manage GeoServer workspaces Add new workspace <i>Reinove selecced workspace(s)</i> | | |
| About GeoServer Data | < | Search Default | |
| Layer Preview Import Data Workspaces Stores | medford opengeo usa | ∢ | |
| Layers Layer Groups Styles WPS Processes | world < | | |

10. Now you will redirect to 'GeoServer: New workspace' page. Here we have to specify the Name and Name Space URI, enter 'BVU_Vector_wp' and 'BVU_vector_wp' respectively in Name and Namespace URI, click on 'Submit' button.

| 10 | New Workspace | | |
|----|--|--|--|
| | Configure a new workspace | | |
| | Name BVU_Vector_wp | | |
| | Namespace URI | | |
| | BVU_vector_wp | | |
| | The namespace uri associated with this workspace | | |
| | Default Workspace | | |
| | | | |
| | Submit Cancel | | |

11. You will redirect back to the 'GeoServer: Workspaces' page, under Workspaces name you can see the newly added 'BVU_Vector_wp' Workspace in the last step.

| 11 Workspaces | |
|--|---------|
| Manage GeoServer workspaces Add new workspace Add new elected workspace(s) | |
| < Results 1 to 5 (out of 5 items) | Search |
| Workspace Name | Default |
| BVU_Vector_wp | |
| medford | < |

12. If you want to delete any Workspace, check the 'Check box' left side to the 'Workspace Name' you want to delete, now you will notice, 'Remove selected Workspace(s)' will be enabled, click over it. Then you will present with 'Confirm Object removal' window, Click 'OK' to delete the workspace.

Creating a Stores

"A store is the name for container of Geographic data (<u>opengeo.org</u>)". In this tutorial we will learn how to connect to the PostGIS database that we created in IGET_WEBGIS_002: PostGIS, i.e., 'BVU_IEER_DB'.

13. Click on the 'Stores' in navigation panel of the GeoServer Window page.



14. Now you will be redirect to the 'GeoServer: Stores' page. Click on 'Add new store', then you will redirect



to the 'GeoServer: New data source' page.

15. Select 'PostGIS' under 'Vector Data Sources'

| New data source |
|--|
| Choose the type of data source you wish to configure |
| Vector Data Sources |
| Directory of spatial files (shapefiles) - Takes a directory of shapefiles and exposes it as a data store |
| G H2 - H2 Embedded Database |
| G H2 (JNDI) - H2 Embedded Database (JNDI) |
| G MySQL - MySQL Database |
| G MySQL (JNDI) - MySQL Database (JNDI) |
| GOGR - Uses OGR as a data source (15) |
| G PostGIS - PostGIS Database |
| 🕼 PostGIS (JNDI) - PostGIS Database (JNDI) |
| Droperties - Allows access to Java Property files containing Feature information |

16. You will present with a form, where you have to fill the basic information to connect our PostGIS database created in *IGET_WEBGIS_002*. Select **BVU_vector_wp**' from down drop list under *Workspace*, enter *Data Source Name* as '**BVU_Vector_st**', '*Description*' as '**Vector files of BVU toposheet**' and Make sure check box of '*Enabled*' is checked.

| | Basic Store Info |
|----------|-------------------------------|
| (16) | Workspace * |
| \smile | BVU_Vector_wp |
| | Data Source Name * |
| | BVU_Vectot_st |
| | Description |
| | Vector files of BVU toposheet |
| | Enabled |

17. Go to the 'Connection Parameters' section, type '54321' under 'port', 'BVU_IEER_DB' under 'database' and enter 'postgres' as username and also as password under 'user' and 'password' fields. Leave all other fields as default and click on 'Save'.



| 1 | | |
|----|----|--|
| (1 | 7) | |
| | | |

| Connection | Parameters |
|------------|------------|
|------------|------------|

| lost* | |
|------------------------------|----|
| ocalhost | |
| ort * | |
| 54321 | |
| atabase | |
| BVU_IEER_DB | |
| chema | |
| public | |
| ser* | |
| postgres | |
| asswd | |
| | |
| amespace * | _ |
| VU_vector_wp | |
| Expose primary keys | |
| nax connections | |
| 10 | |
| nin connections | |
| 1 | |
| etch size | |
| 1000 | |
| connection timeout | |
| 20 | |
| validate connections | |
| rimary key metadata table | |
| | |
| | |
| ession startup SQL | |
| | _/ |
| iession close-up SQL | |
| | |
| ✓ Loose bbox | |
| Estimated extends | |
| | |
| preparedStatements | |
| Nax open prepared statements | |
| encode functions | |
| | |
| | |
| Save | |

18. If the credentials are correct, then you will see the list of the resource/tables contained in the store 'BVU_Vector_st'. If you were not successful, please check the credentials from the IGET_WEBGIS_002.

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Publishing a layer

19. To publish a (single) layer click on the '*Publish*' button, this is located against to the desired layer to be published under '*action*' field. For example: if you want publish '*agriculture_bvu*' click on publish against to it, under '*action*' field here.

| New Layer | | | |
|---|-----------------|--------------|--|
| Add a new layer | | | |
| You can create a new feature type by manually configuring the attribute names and types. Create new feature type On databases you can also create a new feature type by configuring a native SQL statement. Configure new SQL view Here is a list of resources contained in the store 'BVU_Vector_st'. Click on the layer you wish to configure | | | |
| < Results 1 to 23 (out of 23 items) Search | | | |
| Published | Layer name | action | |
| | agriculture_bvu | Publish (19) | |
| | atm_bvu | Publish | |

20. Now you will redirect to the '*Edit Layer*' page, here we have to configure the layer for publishing. Change the '*Basic Resource info*' under '*Data*' tab as shown below.

| BVU_Vector_wp:agriculture_bvu | | | | | | | |
|--|---|--|--|--|--|--|--|
| Configure | the resource and publishing information for the current layer | | | | | | |
| Data | Publishing Dimensions Tile Caching | | | | | | |
| Basic R | esource Info | | | | | | |
| Name | | | | | | | |
| Agricultu | e | | | | | | |
| Title | | | | | | | |
| South Pu | ne Agriculture | | | | | | |
| Abstract | | | | | | | |
| This file is digitized from the south Pune toposheet of BVIEER | | | | | | | |

21. Go to the 'New Keyword' text box, add the relevant keywords, Keywords makes the layers and information easily searchable on server. In our case, the toposheet belongs to Katra area of Pune city. So we are adding these two keywords now. To add keyword, type 'Katraj' in 'New keyword' text box \rightarrow Select the language as 'English' from the down drop list located right side to the text box \rightarrow Click on 'Add Keyword' button to add the key word. Similar add the keyword 'Pune'.

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| Keywords 21 | |
|--|------------------|
| Current Keywords | |
| features 🔺 | |
| agriculture_bvu | |
| ~ | Remove selected |
| New Keyword | |
| katraj 🔶 | English 🗨 |
| Vocabulary | Bengali 🔺 |
| | Tibetan |
| | Breton |
| Add Keyword | Bosnian E |
| | Chechon |
| Metadata links | Chamorro |
| No metadata links so far | Corsican |
| | Cree |
| Add link Note only ECDC and US211 metadata links | Czech |
| Add link Note only Food and Text1 metadata links | Church Slavic |
| Coordinate Reference Systems | Chuvash |
| coordinate Reference Systems | Velsh |
| Native SRS | Danish German |
| | Divehi |
| Declared SRS | Dzongkha |
| | Ewe |
| | Greek |
| SRS handling | English 🔻 |
| Force declared | |

22. Go to the 'Coordinate Reference System' section, here we have to specify the coordinate system of our layer i.e., 'UTM 43N based on WGS84 Datum', Type its code: EPSG: 32643 in the 'Declared SRS'.

OR

If you don't know the SRS ID, then click on 'Find' button then you will see a popup window \rightarrow in the popup window type '43N' in the search box \rightarrow Press 'Enter' \rightarrow Now you will be presented with a number of results, Select 'WGS84/UTM zone 43 N', by clicking on code number '32643'.

| Add link Note only FGDC and TC211 metadata links show up in l | Select a co | ordinate system. Use the search box to narrow the list |
|---|--------------------------------|--|
| Coordinate Reference Systems | Code | Description |
| Native SRS | 24313 | Kalianpur 19927 UTM zone 43N |
| Dealared SPS | 24343 | Kalianpur 1975 / UTM zone 43N |
| EPSG:32643 | 32243 | WGS 72 / UTM zone 43N |
| SRS handling | 32443 | WGS 72BE / UTM zone 43N |
| 23 Force declared | 32643 | WGS 84 / UTM zone 43N |
| | $\left \left<<\right <\right $ | 1 >>>> Results 1 to 25 (out of 0 matches from 4,952 items) |
| Bounding Boxes | | |

- 23. Now select 'Force declared' from the down drop list under 'SRS handling'
- 24. Now go to the Bounding Boxes Section, Here we have to specify the bounding box extent. To do this click on 'Compute from data' under 'Native Bounding Box' and 'Compute from native bounds' under 'Lat/Long Bounding Box'. Now you will notice the extent values in the corresponding text boxes.

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| | 24 | Bounding Box | (es | | | |
|-----|------------------------|--|----------------------------------|-------------------|---------------------|--------------------------|
| | | Native Bounding E | 30. | | | |
| | | Min X | Min Y | Max X | Max Y | |
| | | 375,018.0625 | 2,036,658.5 | 380,139 | 2,042,219.75 | |
| | | Compute from data | 3 | | | |
| | | Lat/Lon Bounding | Box | | | |
| | | Min X | Min Y | Max X | Max Y | - |
| | | 73.816310352774 | 4 18.416357544329 | 73.865133017630 | 18.466907241600 | |
| 25. | Click on | Save 'Save' in t | ve bounds he 'Edit layer' Pag | ge | | |
| 26. | Now you layers of j | will redirect to th published layers. | e 'Layers' page → | where you can see | e the 'Agriculture' | ' layer under the list o |
| _ | | | | | | |

| | world | World | borders | - - | EPSG:4326 | | |
|--|---------------|---------------|-------------|----------|------------|--|--|
| | world | wond | bordera | × | EI 00.4320 | | |
| | world | World | cities | × | EPSG:4326 | | |
| | BVU_Vector_wp | BVU_Vector_st | Agriculture | ~ | EPSG:32643 | | |
| $\left(<< \right) \left(2 \right) \left(>> \right)$ Results 1 to 23 (out of 23 items) | | | | | | | |

27. We published the '*Agriculture*' layer successfully; it is time to preview our work. To do this click on '*Layer Preview*' under 'Data' section.



28. Now you will redirect to the 'Layer Preview' page, in this page you will be presented with all available published layers → Navigate to the 'BVU_Vector_wp: Agriculture' layer that we published earlier. You can search the layer using the keyword we added, type 'Katraj' in search box, press 'Enter' in keybord.

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| Layer Preview 28 | | | | | | | | |
|---|---|------------------------|----------|--|--|--|--|--|
| List of all | List of all layers configured in GeoServer and provides previews in various formats for each. | | | | | | | |
| <<< | 1 > > Results 1 to 25 (out of 0 | matches from 28 items) | 🔍 katraj | | | | | |
| Туре | Name | Title | View | | | | | |
| BVU_Vector_wp:Agriculture South Pune Agriculture OpenLayers Go 29 | | | | | | | | |
| <<<< | << C I > >> Results 1 to 25 (out of 0 matches from 28 items) | | | | | | | |

29. Now select '**OpenLayers**' from the down drop list against to the '**BVU_Vector_wp:Agriculture**' click on ' $Go' \rightarrow Agriculture'$ layer will be published in a new browser window as shown below.



30. Similarly Publish all other layer in the store before proceeding further.

Styling Layer

We published the agriculture layer and would like to style the layer for better visualization purpose. This is necessary step because there is no implicit symbology exists within the geospatial data.

31. To style the agriculture layer, click on 'Styles' under 'Data' section in the navigation panel.



32. Now you will be redirect to the 'GeoServer: Styles' page. Click on 'Add a new style', then you will redirect to the 'GeoServer: New style' page.



33. Now name the style as 'Agruculture Style BVU' select 'BVU_Vector_wp' from workspace dropdown and select polygon from copy from existing style dropdown

| | Name |
|----|--------------------------|
| 33 | Agriculture Style BVU |
| | Workspace |
| | BVU_Vector_wp |
| | Copy from existing style |
| | polygon Copy |

34. Now click on '*copy*', you will notice the text box below is filled with an xml code as show below. It is known as '*Styled Layer Descriptor (SLD)*', an xml file based on the OGC specified format that is used to describe the symbol of features. To know more about the SLD please visit <u>http://www.opengeospatial.org/standards/sld</u>

| Сор | y from existing style | |
|-----|--|----|
| pol | ygon Copy 34 | |
| 7 | 🖻 🛃 12pt 💌 | |
| 1 | xml version="1.0" encoding="UTF-8"? | * |
| 2 | <pre><sld:styledlayerdescriptor pre="" xmlns="http://www.opengis.net/sld" xmlns:oge-<="" xmlns:sld="http://www.opengis.net/sld"></sld:styledlayerdescriptor></pre> | -" |
| 3 | <pre><sld:namedlayer></sld:namedlayer></pre> | |
| 4 | <sld:name>polygon</sld:name> | |
| 5 | <sld:userstyle></sld:userstyle> | |
| 6 | <sld:name>polygon</sld:name> | |
| - 7 | <sld:title>Default polygon style</sld:title> | |
| 8 | <sld:isdefault>1</sld:isdefault> | |
| 9 | <pre><sld:abstract>A sample style that just draws out a solid gray interior with a black 1px outline</sld:abstract></pre> | r |
| 10 | <sld:featuretypestyle></sld:featuretypestyle> | |
| 11 | <sld:name>name</sld:name> | ≡ |
| 12 | <sld:rule></sld:rule> | |
| 13 | <sld:polygonsymbolizer></sld:polygonsymbolizer> | |
| 14 | <sld:fill></sld:fill> | |
| 15 | <pre><sld:cssparameter name="fill">#5CB9EE</sld:cssparameter></pre> | |
| 16 | <pre><sld:cssparameter name="fill-opacity">0.32</sld:cssparameter></pre> | |
| 17 | | |
| 18 | <sld:stroke></sld:stroke> | |
| 19 | | |
| 20 | | |
| 21 | | |
| 22 | | |
| 23 | | |
| 24 | | Ŧ |
| | | 1 |

- SLD file
 - 35. Now edit the this Code as per our requirements, we have to edit *Name, Title* and *CssParemeter* as shown in the below figure. The color codes are in hexadecimal format

35

| 2 | | |
|-----|---|---|
| 1 | xml version="1.0" encoding="ISO-8859-1"? | - |
| 2 | <styledlayerdescriptor <="" th="" version="1.0.0" xmlns="http://www.opengis.net/sld" xmlns:ogc="http://www.opengis.net/ogc"><th></th></styledlayerdescriptor> | |
| 3 | xmlns:xlink="http://www.w3.org/1999/xlink" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" | |
| 4 | <pre>xsi:schemaLocation="http://www.opengis.net/sld http://schemas.opengis.net/sld/1.0.0/StyledLayerDescriptor.xsd"></pre> | |
| 5 | <namedlayer></namedlayer> | |
| 6 | <name>Agriculture style BVU</name> | |
| 7 | <userstyle></userstyle> | |
| 8 | <title>Agriculture BVU</title> | |
| 9 | <abstract>A style that just draws out a solid green interior with a dark green 1px outline</abstract> | |
| 10 | <featuretypestyle></featuretypestyle> | |
| 11 | <rule></rule> | H |
| 12 | <title>Agriclure BVU</title> | |
| 13 | <pre><polygonsymbolizer></polygonsymbolizer></pre> | |
| 14 | <pre>SFill></pre> | |
| 15 | <cssparameter #00ff00<="" cssparameter="" name="fill"></cssparameter> | |
| 16 | <cssparameter name="fill-opacity">0.26</cssparameter> | |
| 17 | | |
| 18 | <stroke></stroke> | |
| 19 | <cssparameter name="stroke">#009900</cssparameter> | |
| 2.0 | <cssparameter name="stroke-width">1</cssparameter> | |
| 21 | S/SUDAES | |
| 22 | | |

36. Now validate the xml code by clicking on the validate button at bottom of the page. If there are no errors, you can see '*No Validation errors*' message on screen similar to the image below.



37. Now click 'Submit' button, you will be redirected to GeoServer: Styles page.

| 37 | III |
|----------------------------|--------|
| SLD file | |
| Choose File No file chosen | Upload |
| Validate | |

38. To assign this style to any polygon layer click on 'Layers' in Navigation panel.



39. Now you will redirect to the 'GeoServer: Layers' page. Now click on 'Agriculture' layer of BVU_Vector_wp under 'Layer Name' section.



| 39 | GeoServer | | | | | | Logge | Logged in as admin. 🧕 Logout | |
|----------|---|----------------------|---|---|--------------------|-------------|----------|------------------------------|--|
| \smile | | La | vers | | | | | | |
| | About & Status Server Status GeoServer Logs Contact Information About GeoServer | Manay A R K | ge the layer dd a new r <i>emove sele</i> | rs being published by GeoServ esource cted resources >>>> Results 1 to 25 (out | er of 25 items) | | | | |
| | Data | | Туре | Workspace | Store | Layer Name | Enabled? | Native SRS | |
| | Layer Preview | | | BVU_Vector_wp | BVU_Vectot_st | Agriculture | v | EPSG:32643 | |
| | Markspaces | | | medford | Digital Elevation | elevation | 4 | EPSG:4326 | |

40. Now click on 'Publishing' tab of BVU_Vector_wp: Agriculture.

| _ | | | | | | | | | |
|----|---|--|--|--|--|--|--|--|--|
| 40 | Edit Layer | | | | | | | | |
| | Edit layer data and publishing | | | | | | | | |
| | BVU_Vector_wp:Agriculture | | | | | | | | |
| | Configure the resource and publishing information for the current layer | | | | | | | | |
| | Data Publishing Dimensions Tile Caching | | | | | | | | |
| | Edit Layer | | | | | | | | |
| | Name | | | | | | | | |
| | Agriculture | | | | | | | | |
| | Enabled Advertised | | | | | | | | |
| | | | | | | | | | |

41. Scroll down to **WMS settings** and select the 'Agriculture Style BVU' from the down drop list under 'Default Style'. In 'Additional styles' section select 'Agriculture Style BVU' and click on the right arrow

button , now you can see the selected style placed under 'Selected Styles' list. Scroll down to the bottom of the page and click on '*Save*'.



42. Now you will redirect back to the 'GeoServer: Layers' page. Now repeat steps 27 – 29 to preview the Agriculture layer with the style we specified in above steps.



Click on the map to get feature info

Grouping the layers

A *Layer Group* is a collection of layers. It contains the information of individual layers and facilitates to request multiple layers through a single WMS request. It saves our time, provides easy access to the layers and makes our work smarter. In this section we will learn how to create a 'transportation group'.

43. To create a Layer group, click on 'Layer Groups' under Data section in Navigation panel of GeoServer page.



44. Now we will direct to 'GeoServer: Layer Groups'. Click on 'Add new layer group'.



45. In the 'New Layer Group' page, enter '**BVU_Transportation**' as 'Name' → Select workspace as **BVU_Vector_wp.** In the Coordinate reference system use '*Find*' to select '*EPSG:32643*' as SRS

| Add a new layer <u>o</u> | rouping | | | |
|--|---|---|------------------------|------------------|
| Name BVU_Transportati Workspace BVU_Vector_w Bounds | on 💌 | 45 | | |
| lin X 374,927.0344554 | Min Y Max X Max Y 4 2,036,578.964066! 380,498.37570720 2,042, | 362.824553 | | |
| Coordinate Refere | nce System | | ▼ | |
| EPSG:32643 Generate Bour | nds (47) | EPSG:WGS 84 / UTM zone 43N |) | |
| EPSG:32643 Generate Bour Add Layer. | Ids 47 46 | EPSG:WGS 84 / UTM zone 43N |) | |
| EPSG:32643 Generate Bour Add Layer ayers Position | Find | EPSG:WGS 84 / UTM zone 43N | Style | Remove |
| EPSG:32643 Generate Bour Add Layer. (ayers Position | Layer BVU_Vector_wp:Bus Stops | EPSG:WGS 84 / UTM zone 43N | Style point | Remove ම |
| EPSG:32643 Generate Bour Add Layer. (.ayers Position 1 | Layer BVU_Vector_wp:Bus Stops BVU_Vector_wp:Higways | EPSG:WGS 84 / UTM zone 43N Default Style | Style point line | Remove ම ම |

46. Click on 'Add Layers', select Bus stops, Highways and Street Roads layers (Published in Step 30) by clicking on their name under Name field in 'Choose new layer' popup window. Use remove button to remove any wrongly added layer.

| Choose new layer | | | × |
|------------------|---------------------------|---------------|---|
| stormdrains | Medford | medford | ^ |
| streets | Medford | medford | |
| wetlands | Medford | medford | |
| zoning | Medford | medford | |
| taxlots | Taxlots | medford | |
| states | USA States | usa | |
| globedata_temp | shapes | world | |
| urbanareas1_1 | shapes | world | |
| volcanoes | shapes | world | |
| borders | World | world | |
| cities | World | world | E |
| agriculture | Delete | Delete | |
| Bus Stops | BVU_Vectot_st | BVU_Vector_wp | |
| << 12 | >> Results 1 to 25 (out o | f 27 items) | - |

- 47. After adding the layers click on '*Generate Bounds*' button to calculate the extent of the layer and leave all other fields default, scroll down to click on '*Save*'.
- 48. No you will redirect to the 'GeoServer: Layer Groups' page. Where you can see newly added 'BVU_Transportation' Group in the list.

| 48 | Layer Groups | | | | | |
|----|--|---------------|--------|--|--|--|
| | Define and manage layer groupings | | | | | |
| | <u>Add new layer group</u> <u>Remove selected layer group(s)</u> | | | | | |
| | << $)$ $)$ $>>$ Results 1 to 6 (out of 6 items) | | Search | | | |
| | Layer Group | Workspace | | | | |
| | medford | | | | | |
| | pop_heatmap | | | | | |
| | temp_surface | | | | | |
| | volcano_cluster | | | | | |
| | C world | | | | | |
| | BVU_Transportation | BVU_Vector_wp | | | | |
| | << I >>> Results 1 to 6 (out of 6 items) | | | | | |

49. Now click on 'Layer Preview' in navigation panel → Now find 'BVU_Transportation' group under Layer Preview list (use navigation tools
 (12)
 if required) → Click on 'Go' to preview the group.



Publishing a Raster file on GeoServer

As now we have covered the vector publishing now we will see how to publish the raster data on GeoServer.

- 50. Create a Workspace named 'BVU_Raster_wp' (refer steps 8-11)
- 51. Create a New Store (refer steps 13 -14) now select 'GeoTIFF' format under 'Raster Data Sources'

Raster Data Sources



52. Name the stores as '**BVU_Raster_st**' using workspace as '**BVU_Raster_wp**' add some description that describes the data correctly the click on '**Browse**' to select the '**BVU_tiff**' from tutorial data and click on '**Save**'.

| Description | | | |
|------------------------------|---------------------|----------|------|
| GeoTIFF | | | |
| Tagged Image File Format wi | h Geographic info | ormation | |
| Basic Store Info | | | |
| Workspace * | | | |
| BVU_Raster_wp | | | |
| Data Source Name * | | | |
| BVU_Raster_st | | | |
| Description | | | |
| Bharati Vidyapeeth Universit | / Satellite imagery | | |
| Enabled | | | |
| Connection Paramete | rs | | |
| URL * | | | |
| file://G:\BVIEER\IGET Tut | orial\`` | Bro | owse |

53. A New raster layer will appear in *New Layer* page \rightarrow click on '*Publish*' in front of the *BVU_Tiff*.

| New Layer | | | | | |
|--|------------|------------|--|--|--|
| Add a new layer | | | | | |
| Here is a list of resources contained in the store 'BVU_Raster_st'. Click on the layer you wish to configure | | | | | |
| << < 1>> Results 1 to 1 (out of 1 items) | | | | | |
| Published | Layer name | action | | | |
| | BVU_Tiff | 53 Publish | | | |
| <<> </td | | | | | |

54. You will direct 'Edit Layer' Page. Now give a proper 'Name', 'Title' and 'Description' as shown below.

| BVU | J Raster wp:BVU Tiff | | | | |
|----------------------|----------------------|----------------------|----------------------------|--|--|
| Configure | the resource and | d publishing informa | tion for the current layer | | |
| Data | Publishing | Dimensions | Tile Caching | | |
| Basic R | esource Info | | | | |
| Name | | | | | |
| BVU_Tiff | 1 | | | | |
| Title | | | | | |
| Bharati V | idyapeet Universit | y Sat. Image | | | |
| Abstract | | | | | |
| Abstract IGET tut | orial demonstratin | a how to publish ra | ster data | | |

55. Add necessary keywords such as 'Katraj' and 'Pune' refer Step 21.



| Keywords | |
|--|-----------------|
| Current Keywor ds | |
| WCS GeoTIFF BVU_Tiff Katraj Pune | Remove selected |
| New Keyword | |
| Pune | • |
| Vocabulary | |
| | |
| Add Keyword | |

56. Unlike the vector data you don't have to generate the *Bounding box* and declare the *Coordinate Reference* system since *Geotiff* format includes the CRS information. If you think anything went wrong you can change the SRS. Now we are accepting it because the layer is assigned to right SRS, click on '*Save*' to finish.

| Native SKS | | | |
|---|---|--------------------------|-----------------------------|
| EPSG:32643 | | E | PSG:WGS 84 / UTM zone 43N |
| Declared SRS | | | |
| EPSG:32643 | | | Find EPSG:WGS 84 / UTM zone |
| SRS handling | | | |
| Reproject native t | o declared 💌 | | |
| | | | |
| Bounding Boxe | 25 | | |
| Native Bounding Bo | x | | |
| Min X | Min Y | Max X | Max Y |
| 374,955 | 2,036,835 | 380,145 | 2,042,235 |
| Compute from data | | | |
| Compute norm data | | | |
| Lat/Lon Rounding R | | | |
| Lat/Lon Bounding B | lox | Marri V | |
| Lat/Lon Bounding B Min X | Box Min Y | Max X | Max Y |
| Lat/Lon Bounding B Min X 73.815712243469 | Min Y 18.417948732898 | Max X 73.865179361424 | Max Y 18.467045387255 |
| Lat/Lon Bounding B Min X 73.815712243469 Compute from nativ | Min Y 18.417948732898 /e bounds | Max X 73.865179361424 | Max Y 18.467045387255 |
| Lat/Lon Bounding B Min X 73.815712243469 Compute from nativ Coverage Para | Box Min Y 18.417948732898 /e bounds meters | Max X 73.865179361424 | Max Y 18.467045387255 |
| Lat/Lon Bounding B Min X 73.815712243469 Compute from nativ Coverage Paral InputTransparentC | Box Min Y 18.417948732898 /e bounds meters olor | Max X 73.865179361424 | Max Y 18.467045387255 |
| Lat/Lon Bounding B Min X 73.815712243469 Compute from nativ Coverage Paral InputTransparentC | Box Min Y 18.417948732898 /e bounds meters olor | Max X 73.865179361424 | Max Y 18.467045387255 |
| Lat/Lon Bounding B Min X 73.815712243469 Compute from nativ Coverage Para InputTransparentC SUGGESTED TILE S | Nox Min Y 18.417948732898 /e bounds meters olor | Max X 73.865179361424 | Max Y 18.467045387255 |
| Lat/Lon Bounding B Min X 73.815712243469 Compute from nativ Coverage Para InputTransparentC SUGGESTED_TILE_S 512.512 | Box Min Y 18.417948732898 /e bounds meters olor IZE | Max X 73.865179361424 | Max Y 18.467045387255 |

57. Now go to the 'Layer Preview' search for '*Katraj*' (Note: this will work only if you have added katraj as keyword as mentioned in step 55). Navigate to '*BVU_Raster_wp*: $BVU_Tiff' \rightarrow Click$ on '*Go*'.

gel

| Layer Preview 57 | | | | | | |
|---|--|------------------------|-----------------|--|--|--|
| List of all layers configured in GeoServer and provides previews in various formats for each. | | | | | | |
| | 1 >>> Results 26 to 32 (out of 0 matches | 🔍 katraj | | | | |
| Туре | Name | Title | View | | | |
| | BVU_Vector_wp:Agriculture | South Pune Agriculture | OpenLayers Go | | | |
| | BVU_Raster_wp:BVU_Tiff | BVU_Tiff | OpenLayers 🔽 Go | | | |
| <<< | 1 >>> Results 26 to 32 (out of 0 matches | from 32 items) | | | | |

58. Now you can see the published 'Satellite image covering Bharati Vidyapeeth University, along with Katraj Snake Park and Upper Katraj Lake' in your browse window.



Task 1: Create a styling for Water bodies and publish the layer.

Task 2: Create a styling for Roads and publish the layer.

Task 3: Create Services layer group by using tutorial data.