

ANNEXURE - 4  
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## 1.1 Introduction

This guide is a supporting document for the installation of PLATO applications. You can find the reference in the respective installation guides.

## 1.2 How to do Multi Node setup (High Availability Architecture)

### 1.2.1 Configuration Server Related Changes:

The below changes are to be made in the PROPERTIES table pointed to by the Configuration Server:

- **For the Discovery Server:**

PLATO Discovery Service should have an entry for its entire peer PLATO Discovery Services configured through **eureka.client.serviceUrl.defaultZone**. This will hold a comma-separated list of all the peer PLATO Discovery services.

In addition, to enable the peer aware mode for the PLATO Discovery Service we should set the **eureka.client.register-with-eureka** to true.

ID	APPLICATION	PROFILE	LABEL	KEY	VALUE
1	plato-discovery-service	jdbc	jdbc	eureka.client.serviceUrl.defaultZone	http://<IP of the server where the first instance of PLATO Discovery Service is running>:<PORT where the first instance of PLATO Discovery Service is running>/plato-discovery-service/eureka,http://<IP of the server where the second instance of PLATO Discovery Service is running>:<PORT where the second instance of PLATO Discovery Service is running>/plato-discovery-service/eureka
2	plato-discovery-service	jdbc	jdbc	eureka.client.register-with-eureka	true
3	plato-discovery-service	jdbc	jdbc	server.port	<< PORT Number where the PLATO Discovery Service is running >>

- **For the Individual Services:**

Each service should have an entry of all the PLATO Discovery Services configured through **eureka.client.serviceUrl.defaultZone**. This will hold a comma separated list of all the PLATO Discovery services.

ID	APPLICATION	PROFILE	LABEL	KEY	VALUE
1	<<service-name>>	jdbc	jdbc	eureka.client.serviceUrl.defaultZone	http://<IP of the server where the first instance of PLATO Discovery Service is running>:<PORT where the first instance of PLATO Discovery Service is running>/plato-discovery-service/eureka,http://<IP of the server where the second instance of PLATO Discovery Service is running>:<PORT where the second instance of PLATO Discovery Service is running>/plato-discovery-service/eureka

### 1.2.2 Plato UI Configuration Server Related Changes:

For each of the product registered in **PRODUCT\_SERVICES\_ENV\_LEDGER**, we need to change the URL to point to the Load Balancer of the PLATO API Gateway Service.

ID	PRODUCT_NAME	URL
1	<<PRODUCT NAME>>	<< HTTP URL OF THE LOAD BALANCER >>

### 1.2.3 setDomainEnv.sh related changes:

- **For all the Micro Services:**

Individual MICRO services should now access the PLATO Config Service via the Load Balancer URI (i.e). configured in the server runtime through the property **plato.services.config.uri**.

The **plato.services.config.uri** must point to the URI of the load balancer. The format of the same would be as follows:

```
-Dplato.services.config.uri=http://<< IP OF THE LOAD BALANCER >>:<< PORT OF THE LOAD BALANCER >>
```

- **For the UI APPSHELL:**

UI APPShell should now access the Gateway Service via the Load balancer URI (i.e.) configured in the server runtime. For example, **Dapigateway.url**.

The **apigateway.url** must point to the host and port of the load balancer. The format of the same would be as follows:

```
-Dapigateway.url=http://<< IP OF THE LOAD BALANCER >>:<< PORT OF THE LOAD BALANCER >>
```

## **1.2.4 Requirement of Load Balancers:**

Load Balancers are required for PLATO API GATEWAY Service, PLATO Configuration Service, and PLATO UI APP SHELL.

### **1.2.4.1 PLATO API Gateway Service:**

PLATO API Gateway Service acts as a single point of entry for UI and External Systems to access the underlying services. In a multi node deployment where multiple PLATO API Gateway Services are deployed, we would need a single URI for accessing the multi node deployments of the PLATO API Gateway Services. This Load Balancer would help us to achieve that functionality.

### **1.2.4.2 PLATO Configuration Service:**

All the domain services access PLATO Configuration Service for retrieving their configurations. In a multi node deployment where multiple PLATO Configuration Services are deployed, we would need a single URI for accessing the multi node deployments of the PLATO Configuration Services. This Load Balancer would help us to achieve that functionality.

### **1.2.4.3 PLATO UI APP SHELL:**

The PLATO UI App Shell acts as the single user interface for the users. In a multi node deployment where multiple instances of PLATO UI APP SHELL are deployed, we would need a single URI for accessing the multi node deployments of the PLATO UI APP SHELL. This Load Balancer would help us to achieve that functionality.

## **1.3 PLATO LOAD BALANCER SERVICES**

This section contains the following sub-sections:

- Introduction
- Configuration and Deployment

### **1.3.1 Introduction**

Plato Load Balancer Services can be used as an optional Load Balancer for a service when required. It is available as a WAR file and the configuration can be done directly inside the WAR file.

### 1.3.2 Configuration and Deployment

1. Open the WAR file using extraction tools and open the **web.xml** file. The **web.xml** file is as shown below:

```
<?xml version="1.0" encoding="UTF-8"?>
<web-app xmlns:wls="http://xmlns.oracle.com/weblogic/weblogic-web-app"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://xmlns.oracle.com/weblogic/weblogic-web-app">
  <servlet>
  <servlet-name>HttpClusterServlet</servlet-name>
  <servlet-class>
    weblogic.servlet.proxy.HttpClusterServlet
  </servlet-class>
  <init-param>
    <param-name>WebLogicCluster</param-name>
    <param-value>HOST_1:PORT_1|HOST_2:PORT_2|HOST_3:PORT_3</param-value>
  </init-param>
</servlet>
<servlet-mapping>
```

2. Edit the **HOST:PORT** in the **web.xml** file. The host and port values must be added according to the requirement.
3. After editing the **web.xml** file, the WAR file can be deployed directly into the managed server. The **HOST:PORT** of the **plato-load-balancer-services** would act as the load balancer URL for the mentioned **HOST:PORT** values in the **web.xml** file.

## 1.4 NGINX LOAD BALANCER SERVICES

This section contains the following sub-sections:

- Installation and Setup
- Load Balancer Route Configurations

## 1.4.1 Installation and Setup

### 1.4.1.1 Download

1. Download the tar file from [nginx.org/download/](http://nginx.org/download/) Index list.
2. Extract the tar file using `tar -xvf` command

### 1.4.1.2 Installation

1. You can choose installation location using `--prefix=path` parameter.
2. You can find `./configure` file in the extracted folder above. For installation follow the below procedure.
3. Inside the extracted folder, run the following commands one after other

```
./configure --prefix=/scratch/nginx --with-http_ssl_module  
  
make
```

4. You can find the `nginx` installed at `/scratch/nginx`.

### 1.4.1.3 Start and Stop Procedure

1. Inside the installed directory, we can find `sbin` folder. Run `./nginx` file inside `sbin` folder to start `nginx`.
2. Write `./nginx -s` stop command in order to stop `nginx`.

### 1.4.1.4 Configuration:

The configuration is done in the `nginx.conf` file inside the `conf` directory.

1. For Load Balancing, create an upstream and place the URLs to be routed.

```
upstream config{  
    server 10.184.155.115:7004;  
    server 10.184.148.116:7004;  
}  
  
upstream gateway{  
    server 10.184.155.115:7005;
```

Here there are two load balancers defined. Default load balancing technique: **Round Robin**

This block must be placed inside the `http` block.

2. Configure the Server block. It is also placed inside the http block. The server block is used for routing purposes.

The block is as shown below.

```
server {  
    listen      8090;  
    server_name _;  
  
    location / {  
        proxy_pass http://config;  
    }  
    location /api {  
        rewrite /api/(.*) /$1 break;  
        proxy_pass http://gateway;  
    }  
  
    error_page 500 502 503 504 /50x.html;
```

Here 8090 acts as the listen port for **nginx**.

The **server\_name** property should be given if the requests are from a particular server. Here Server accepts requests from any server.

The **proxy\_pass** is used to route the request and the format of the request is defined in the location tag.

The **rewrite** tag is used to manipulate the requests.

**NOTE:** Make sure the firewall is open for other IPs to pass the request.



## 1.4.2 Load Balancer Route Configurations

The below configurations gives the route configurations for the load balancer:

**NOTE:** The underlying syntax and semantics may vary from load balancer to load balancer.

```
    upstream config-service{
        server << IP Or Hostname of the PLATO Configuration
Service 1 >>:<< Port of the PLATO Configuration Service 1 >>;

        server << IP Or Hostname of the PLATO Configuration
Service 2 >>:<< Port of the PLATO Configuration Service 2 >>;

        server << IP Or Hostname of the PLATO Configuration
Service 3 >>:<< Port of the PLATO Configuration Service 3 >>;

        server << IP Or Hostname of the PLATO Configuration
Service N >>:<< Port of the PLATO Configuration Service N >>;

    }

    upstream api-gateway{

        server << IP Or Hostname of the PLATO API Gateway Service
1 >>:<<Port of the PLATO API Gateway Service 1 >>;

        server << IP Or Hostname of the PLATO API Gateway Service
2 >>:<<Port of the PLATO API Gateway Service 2 >>;

        server << IP Or Hostname of the PLATO API Gateway Service
3 >>:<<Port of the PLATO API Gateway Service 3 >>;

    }
```

```

upstream <<Context Root of the PLATO UI APP Shell>> {

    server << IP Or Hostname of the PLATO UI APP Shell 1 >>:<<
Port of the PLATO Configuration Service 1 >>;

    server << IP Or Hostname of the PLATO UI APP Shell 2 >>:<<
Port of the PLATO UI APP Shell 2 >>;

    server << IP Or Hostname of the PLATO UI APP Shell 3 >>:<<
Port of the PLATO UI APP Shell 3 >>;

    .

    .

    server << IP Or Hostname of the PLATO UI APP Shell N >>:<<
Port of the PLATO UI APP Shell N >>;

}

server {

    listen << PORT OF THE LOAD BALANCER >>;

    server_name _;

    location /config-service {
        proxy_pass http://config-service;
    }

    location /api-gateway {
        proxy_pass http://api-gateway;
    }
}

```



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