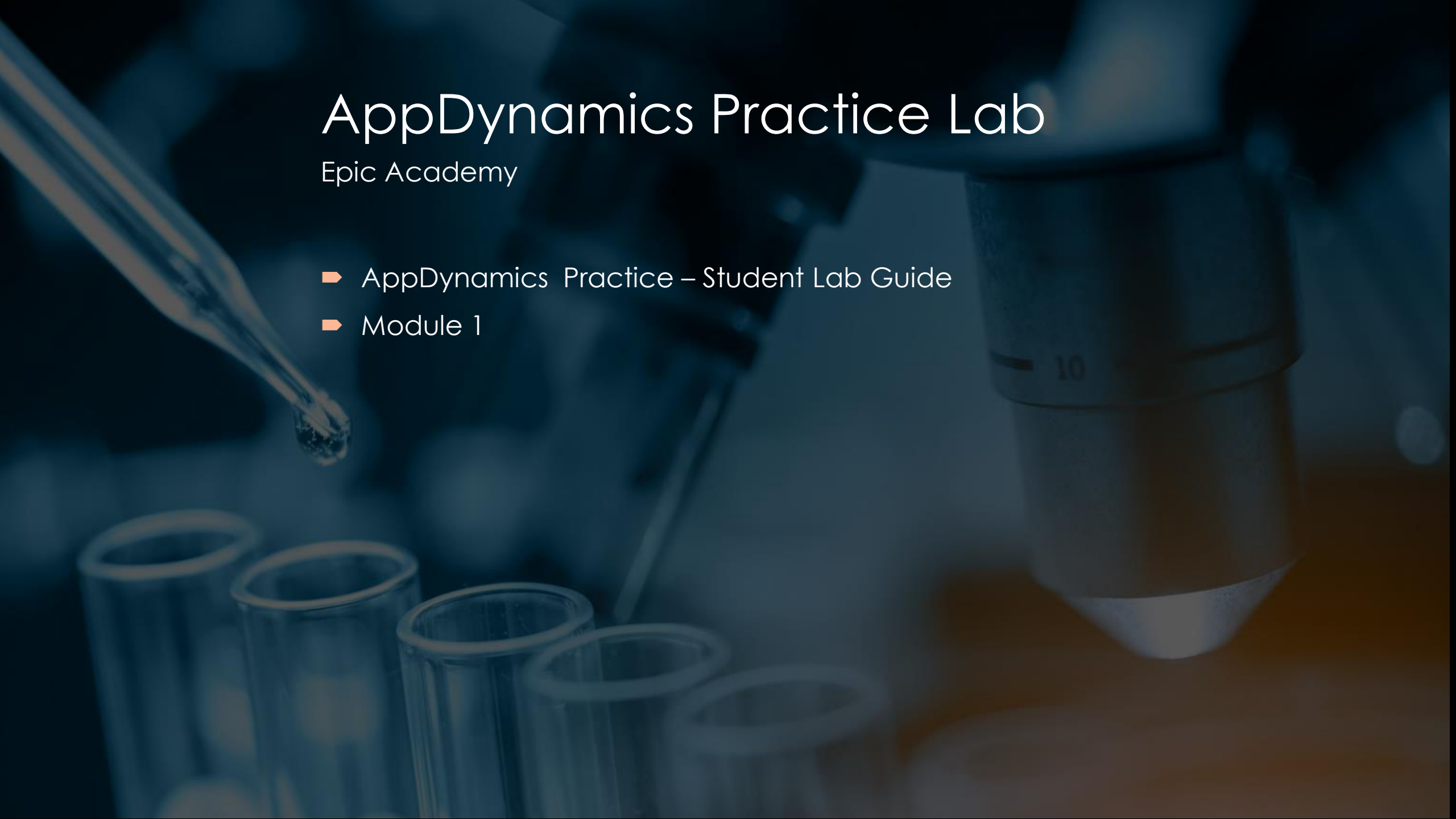


AppDynamics Practice Lab

Epic Academy

- AppDynamics Practice – Student Lab Guide
- Module 1

AppDynamics Lab Guide

This lab will guide you into the foundational concepts discussed in AppDynamics Foundation video course. Its extremely important you go though the video course so you can understand the concepts before engaging with the lab.

Disclaimer:
This lab is based on the AD-Capital AppDynamics docker file that is available on GitHub. –This is not my innovation. Its simpler to setup for most people than the **online banking application** used in the online video course

There is also a separate lab installation guide for people that want to get their hands dirty with installing applications and agent themselves.

Please refer to that file in the content area.

Note: The video approach is different as this takes concept by concept approach for each lab item covered within the foundation course

***Advanced course will be out soon

Module 1
Learning Targets

- After completing this module you should be able to

- Identify AppDynamics monitoring structure or framework
- Explain the Application, Tiers and node concept
- Explain the Business Transaction concept and give examples
- Baseline and Metric Browser (Comparing baseline and actual)
- Configure transaction threshold
- Understand diagnostics sessions and snapshot

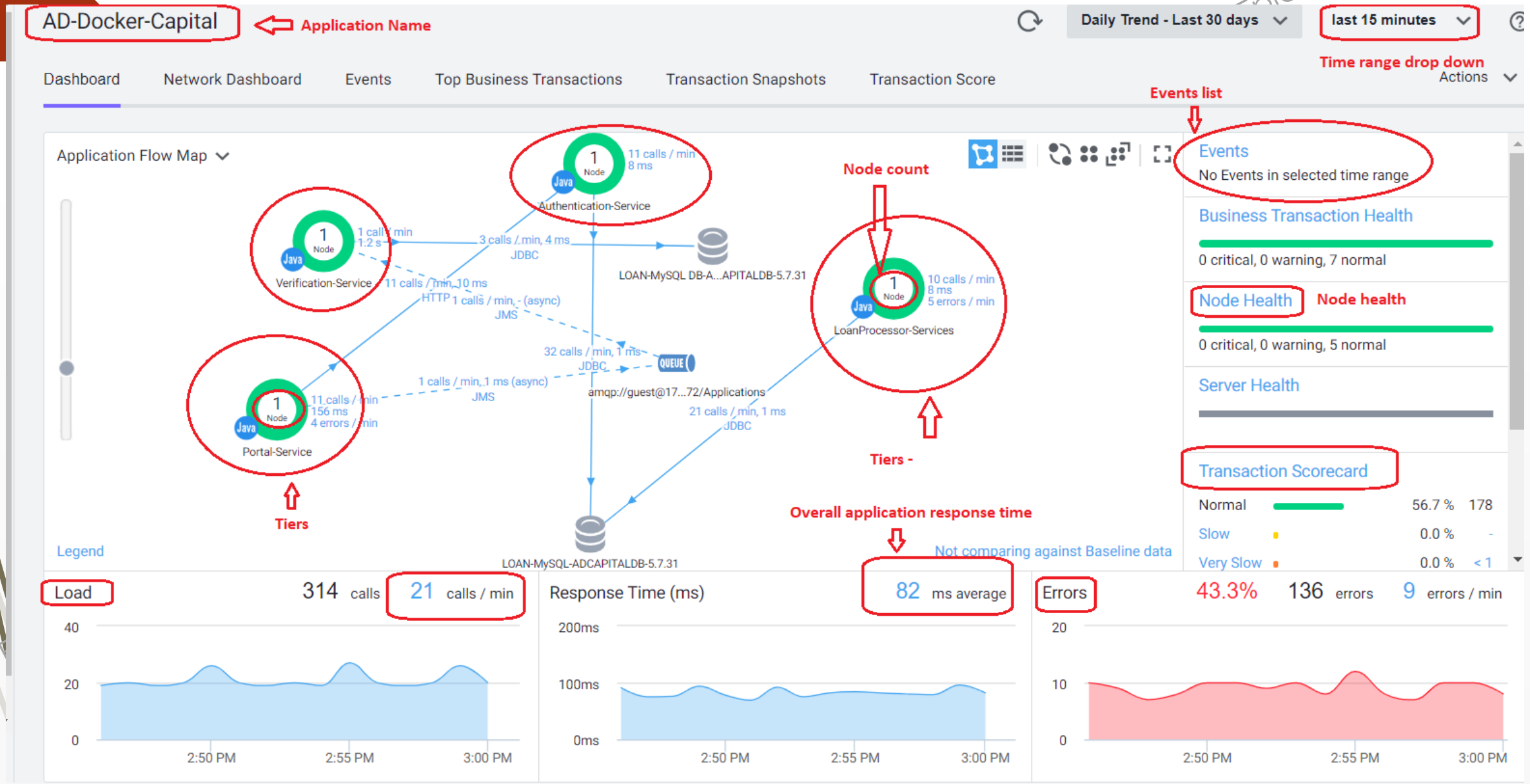
Before you begin

Login to your virtual machine and start the AD-Capital demo environment using docker-compose up

```
root@localhost AD-Capital-Docker]#
root@localhost AD-Capital-Docker]#
root@localhost AD-Capital-Docker]#
root@localhost AD-Capital-Docker]# docker-compose up
```

```
adcapitalload   | INFO: Current User: Lars Poole, Level: Silver
adcapitalload   | Jul 18, 2020 8:15:35 AM com.appdynamics.analytics.demo.LoadRunner callPortalSubmitApplication
adcapitalload   | INFO: Keefe Sears, your application has been submitted. ID: 66000 Carca83ebb1-aad7-4814-a708-9b4e64f04777
adcapitalload   | Jul 18, 2020 8:15:41 AM com.appdynamics.analytics.demo.LoadRunner callProcessorUnderWrite
```

AppDynamics Application Dashboard – **Flow Map**



AppDynamics Application Dashboard – **Flow Map**

The AppDynamics Flow map or dependency mapping as its popularly called by gives you the overview of how well your application is doing.

The **flow map** page shows the following

- Business Transaction Health
- Server Health
- Transaction score card which categorizes all transaction into Normal, slow, very slow and stalled or have errors. Note that stalled transactions are transactions that never completed or errored
- Load
- Response Time
- Errors

The Event tab list series of events happening within the application

The time range drop down allows for historical and real time review

AppDynamics Application Dashboard – **Customise Flow Map**

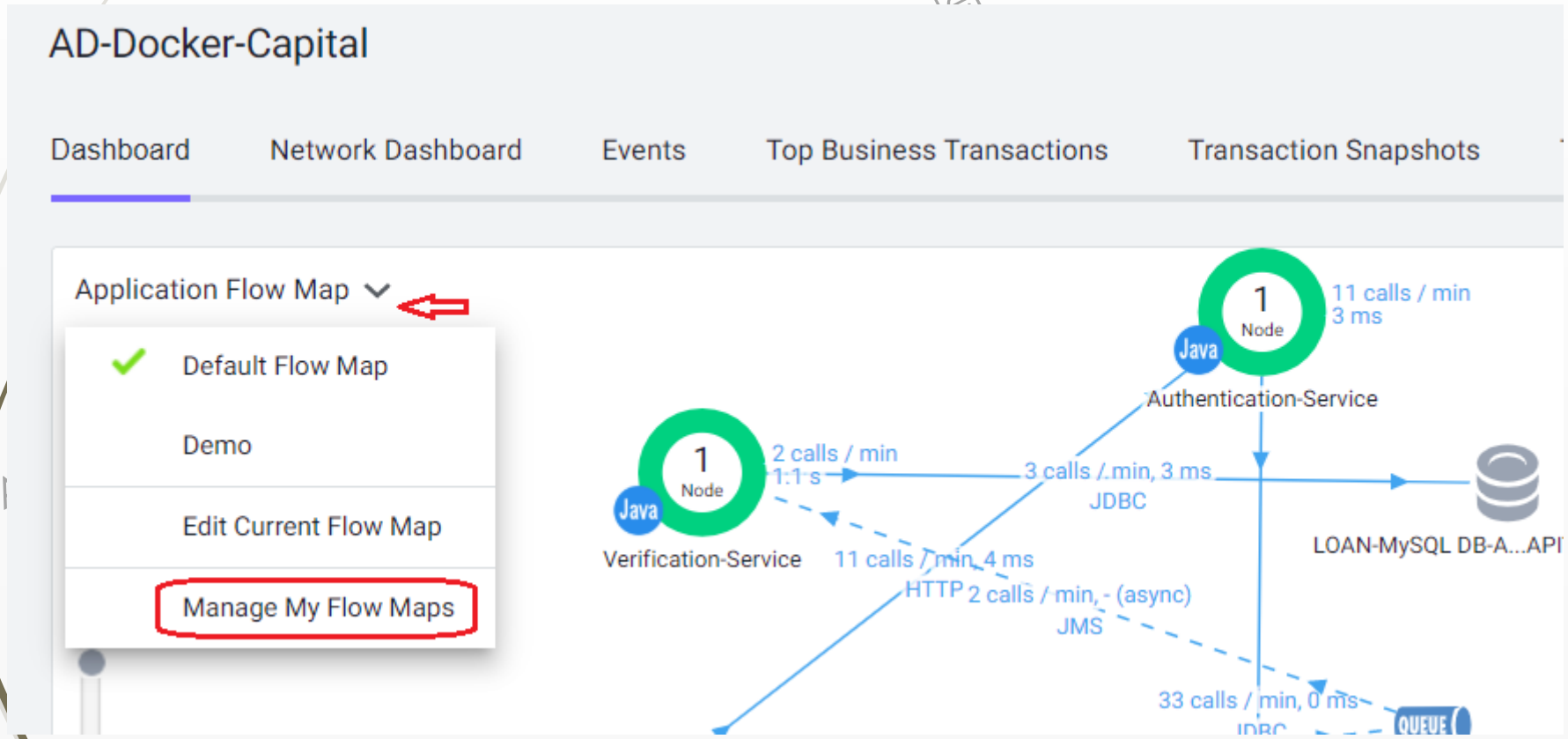
Exercise 1 – Customize Flow map

Scenario: Due to the sensitivity of AD Capital application, the audit team verifies all loan request to ensure it meets requirement before approval. They are also responsible to the operations of the Verification services which has been grouped as part of the AD Capital application. They recently requested that you create a flow map view for them? How will you achieve that?

AppDynamics Application Dashboard – **Customize Flow Map**

Exercise 1 – Customize Flow map - Instructions

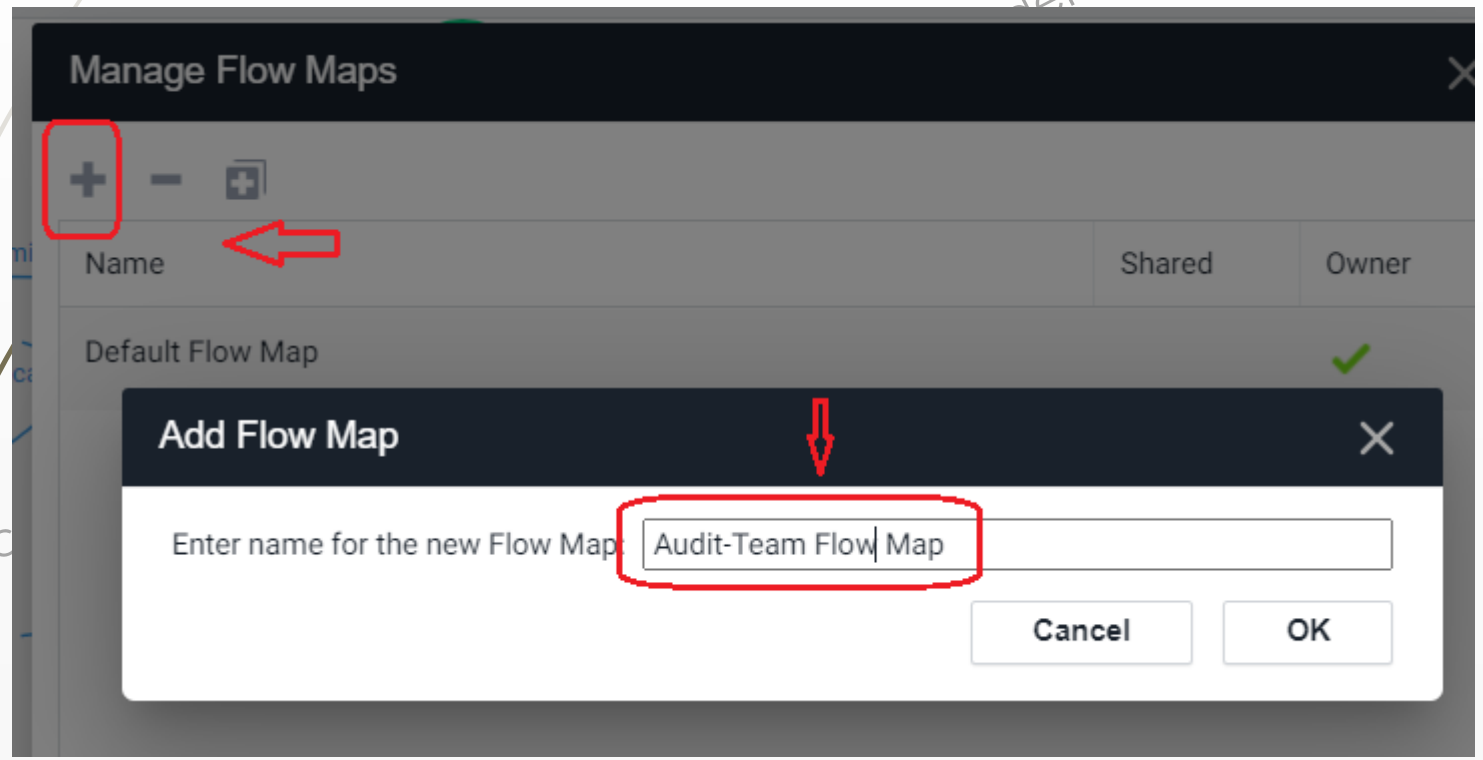
1. From the Flow Map page, select application flow map page and select manage flow map.



AppDynamics Application Dashboard – **Customize Flow Map**

Exercise 1 – Customize Flow map - Instructions

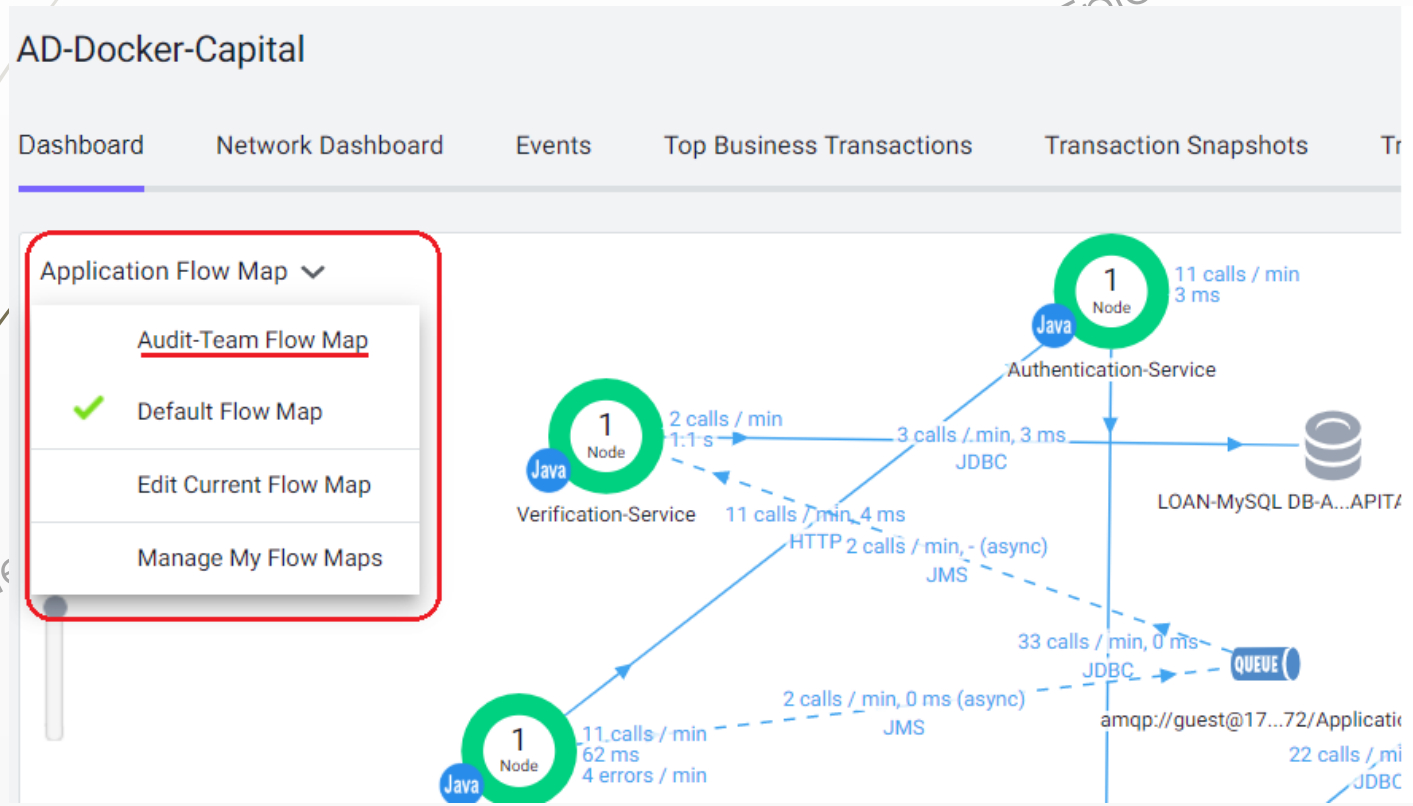
2. Click on the (+) sign to add a new flow map and name it Audit-Team Flow Map and click ok and close



AppDynamics Application Dashboard – **Customize Flow Map**

Exercise 1 – Customize Flow map - Instructions

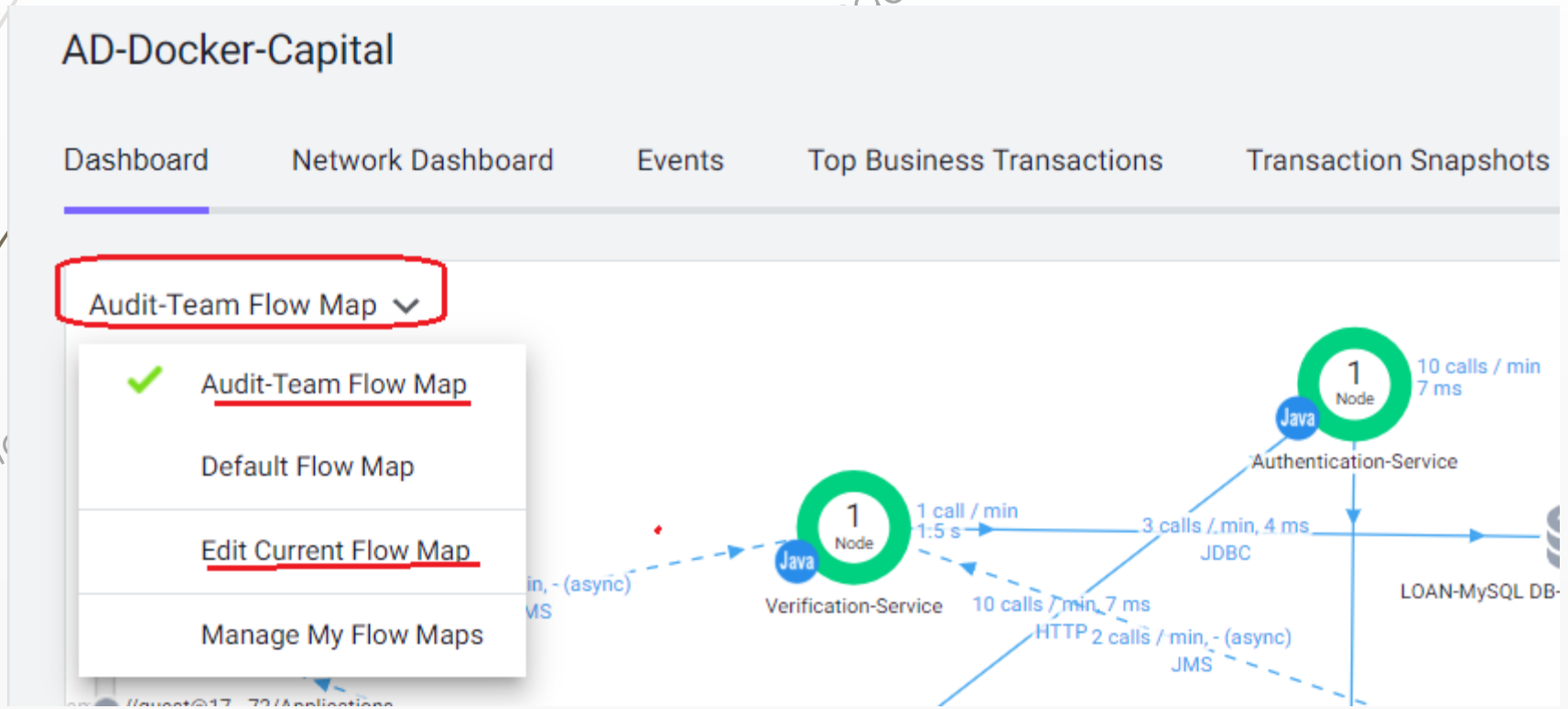
3. Click on the Application Flow map drop down again. At this point you should see the flow map you created but it will still have all the default services in it. Select it



AppDynamics Application Dashboard – **Customize Flow Map**

Exercise 1 – Customize Flow map - Instructions

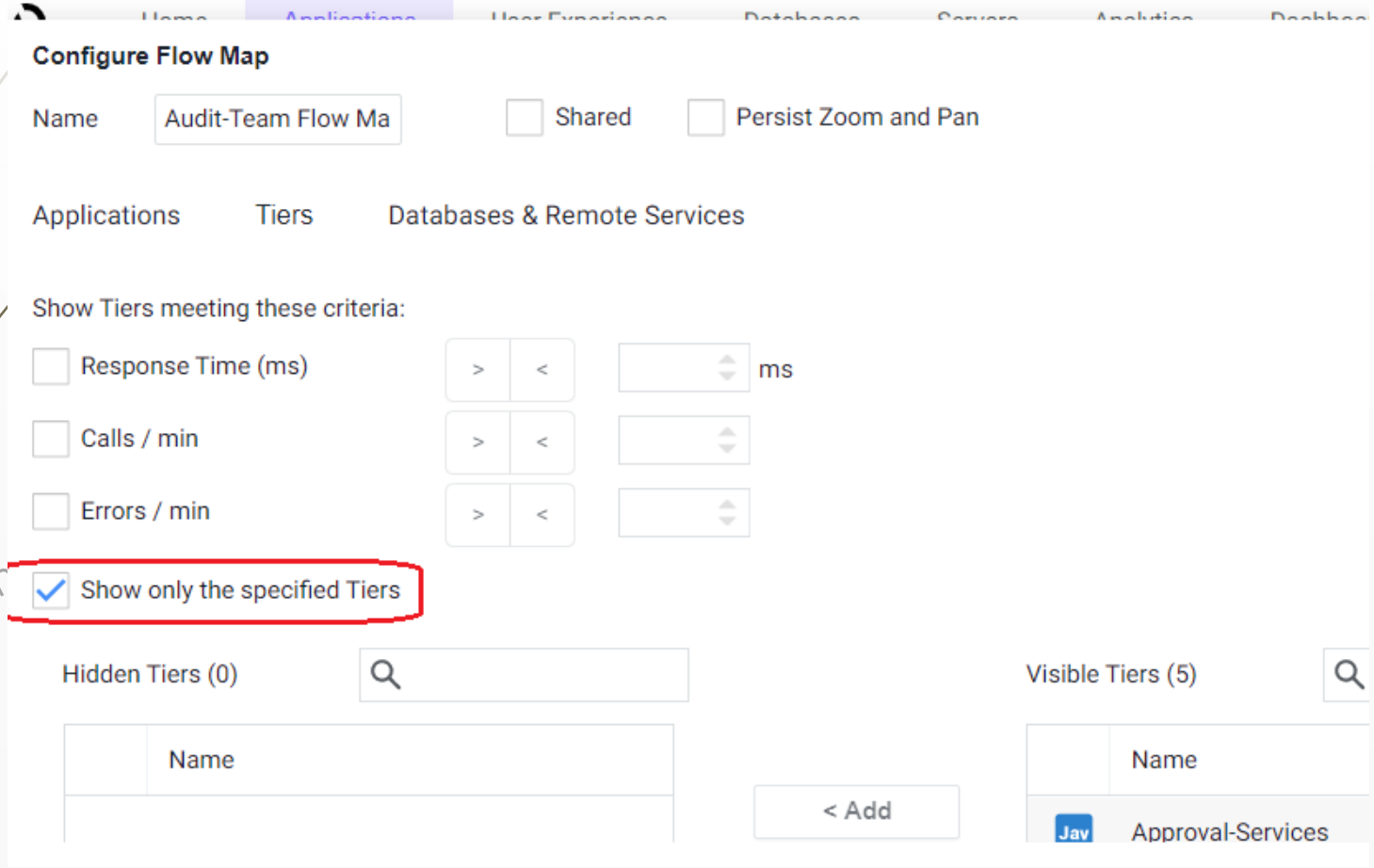
4. Click on the Application Flow map drop down again. At this point you should see the flow map you created but it will still have all the default services in it. Select it and go back to the same drop down and select "Edit current flow map"



AppDynamics Application Dashboard – **Customize Flow Map**

Exercise 1 – Customize Flow map - Instructions

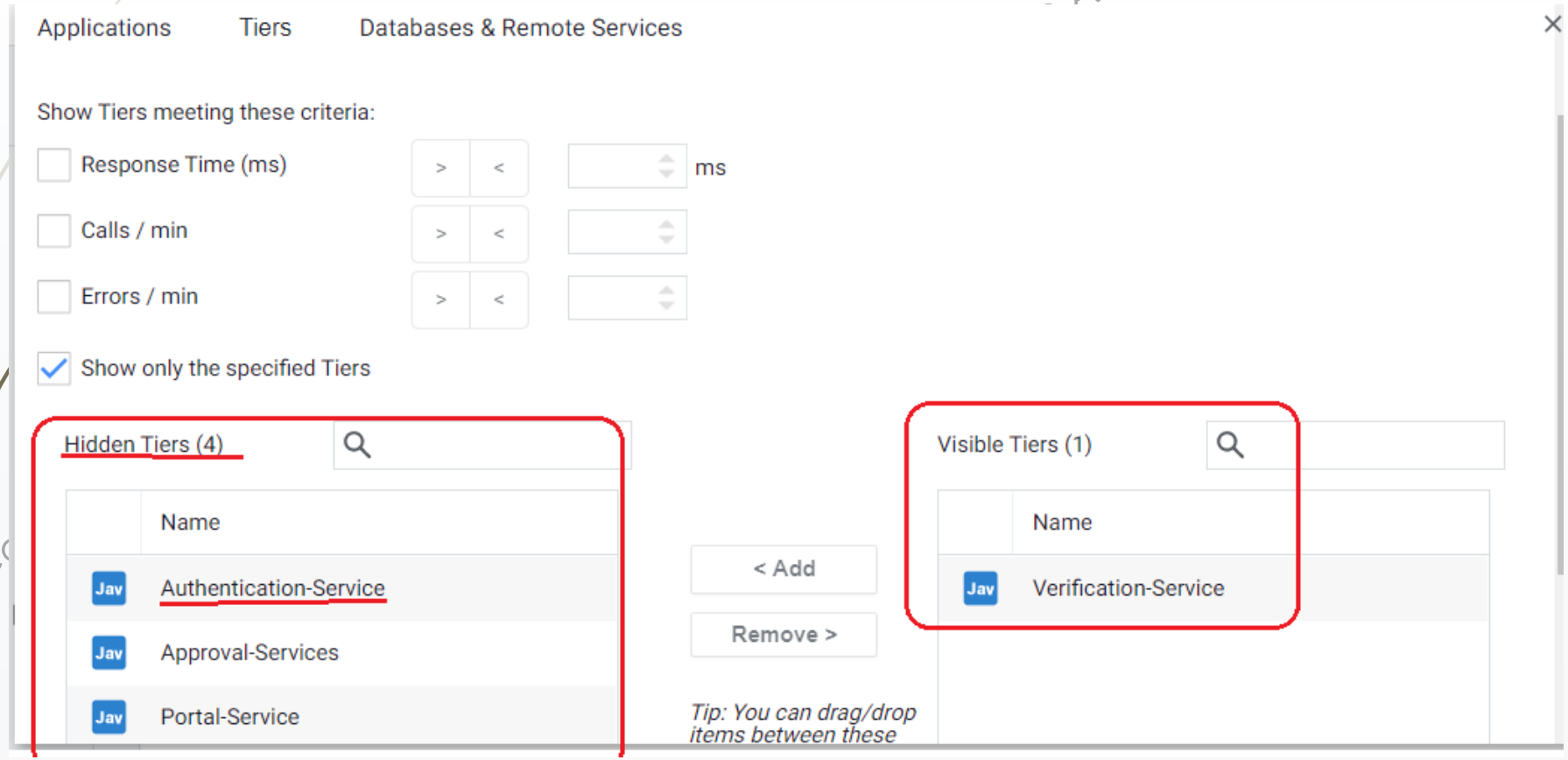
5. "Click on show only specified tiers" and the tiers for selection will appear



AppDynamics Application Dashboard – **Customize Flow Map**

Exercise 1 – Customize Flow map - Instructions

6. "Click on show only specified tiers" and the tiers for selection will appear. Select other tiers except Verification Tier and add them to the hidden tiers and save.

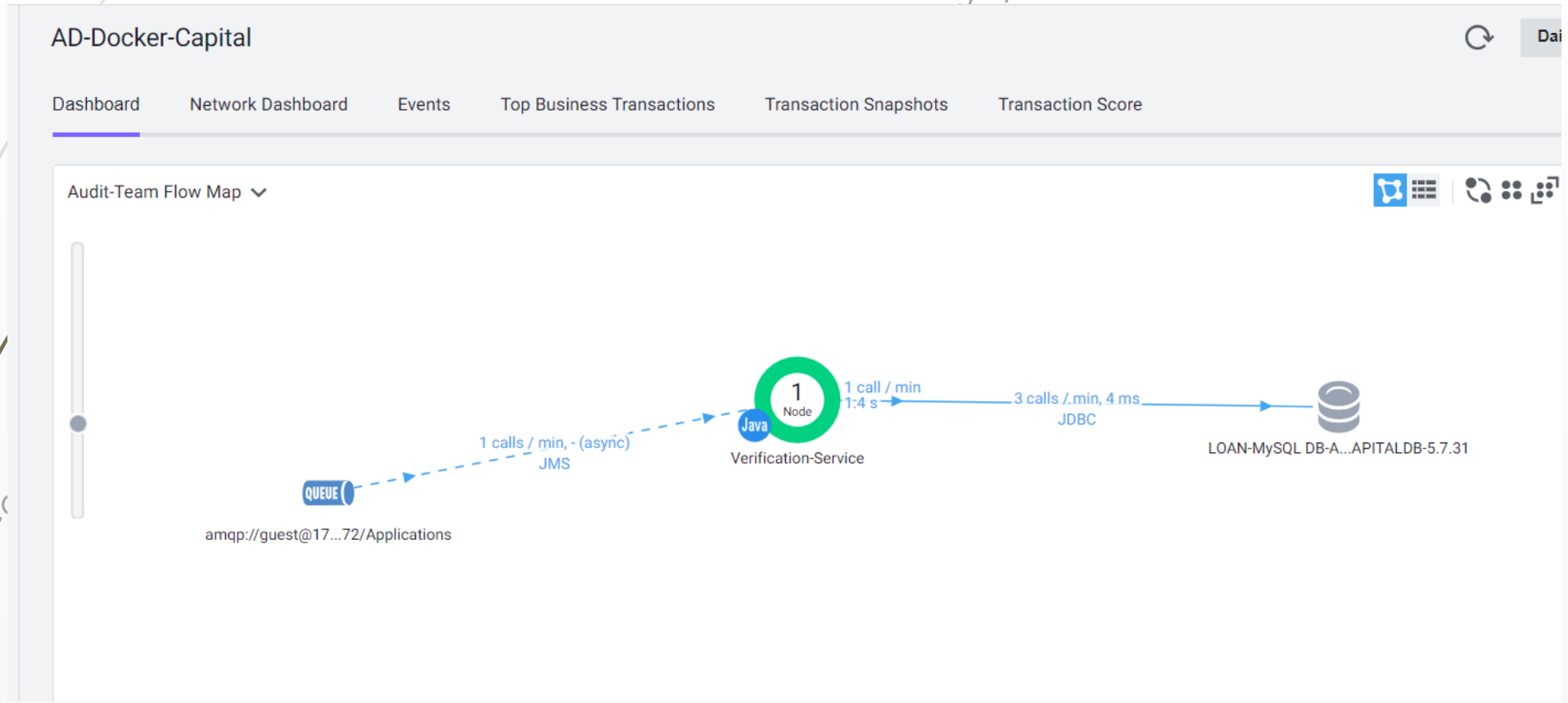


AppDynamics Application Dashboard – **Customize Flow Map**

Exercise 1 – Customize Flow map - Instructions

7. Your flow map should look like this. Share the link with the Audit team. Your dashboard should look like this

http://192.168.56.40:8090/controller/#/location=APP_DASHBOARD&timeRange=last_1_hour.BEFORE_NOW.-1.-1.60&application=11&dashboardMode=force?timeRange=last_1_hour.BEFORE_NOW.-1.-1.60



AppDynamics Application Dashboard – **Customize Time Frame**

Exercise 2 – Customize Time of Period Evaluation

Scenario– Customize Time of Period Evaluation

AppDynamics allows you to do evaluation based on real time data and based on historical data

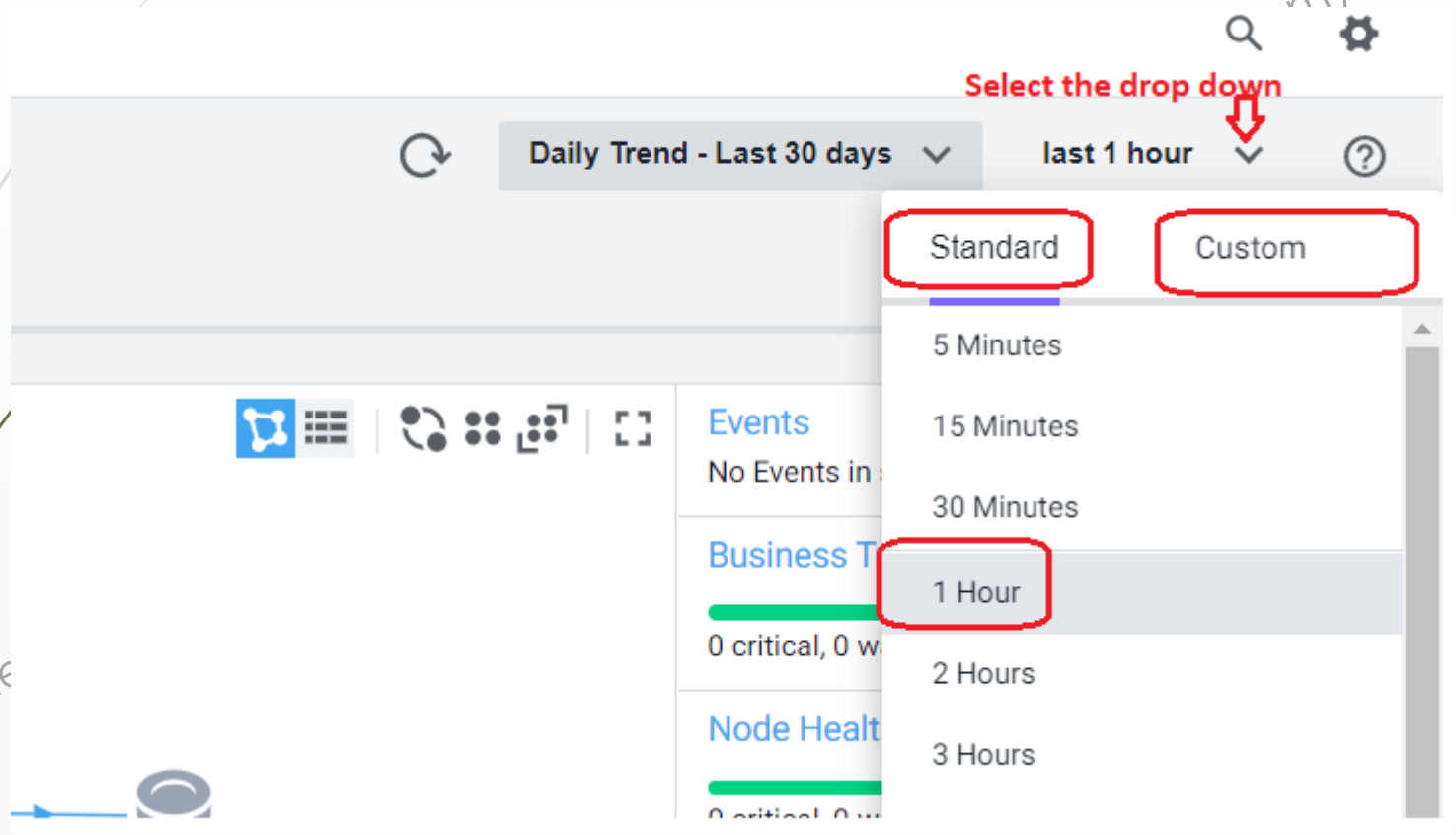
Scenario

There was a performance issue reported by the customer care that customers could not login from 7:00AM – 10:00AM the previous day. As an AppDynamics performance analyst, Use AppDynamics custom time period to select this and share for further review.

AppDynamics Application Dashboard – **Customize Flow Map**

Exercise- 2– Customize Time of Period Evaluation - Instructions

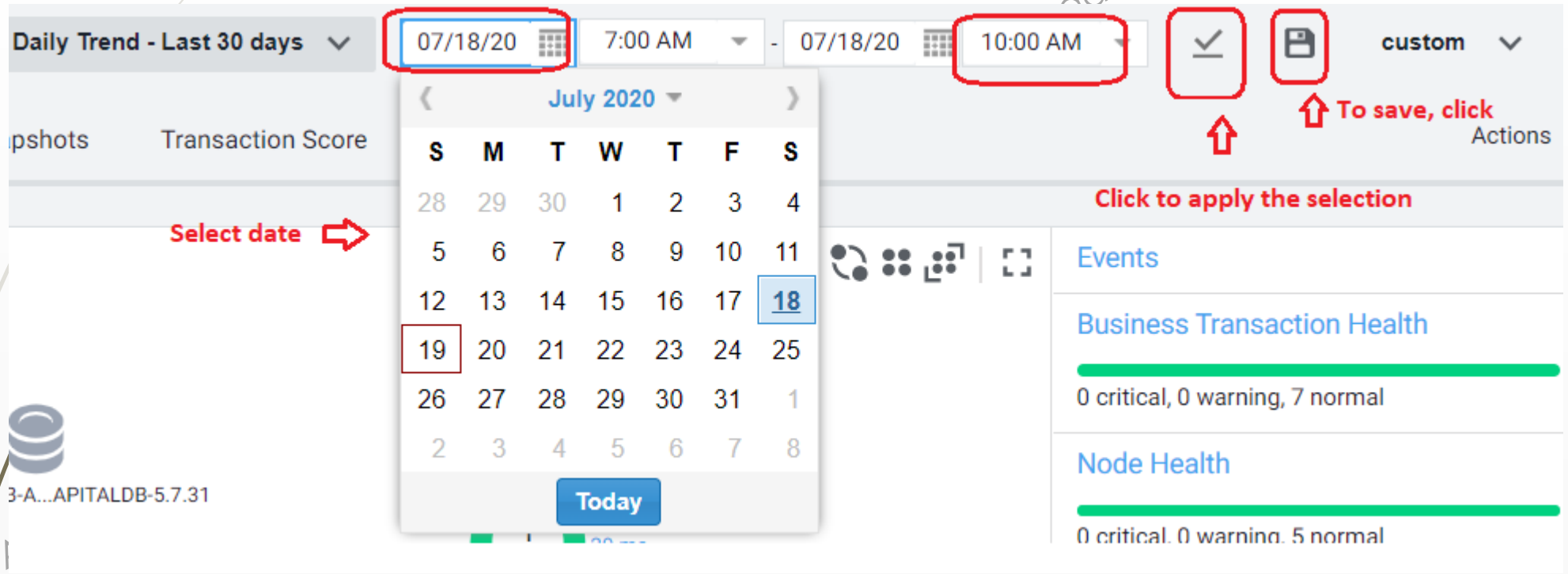
Select the drop down, and select Custom, A time range appears. Select the previous day 7:00AM – 10:00AM



AppDynamics Application Dashboard – **Customize Flow Map**

Exercise 2 – Customize Time of Period Evaluation - Instructions

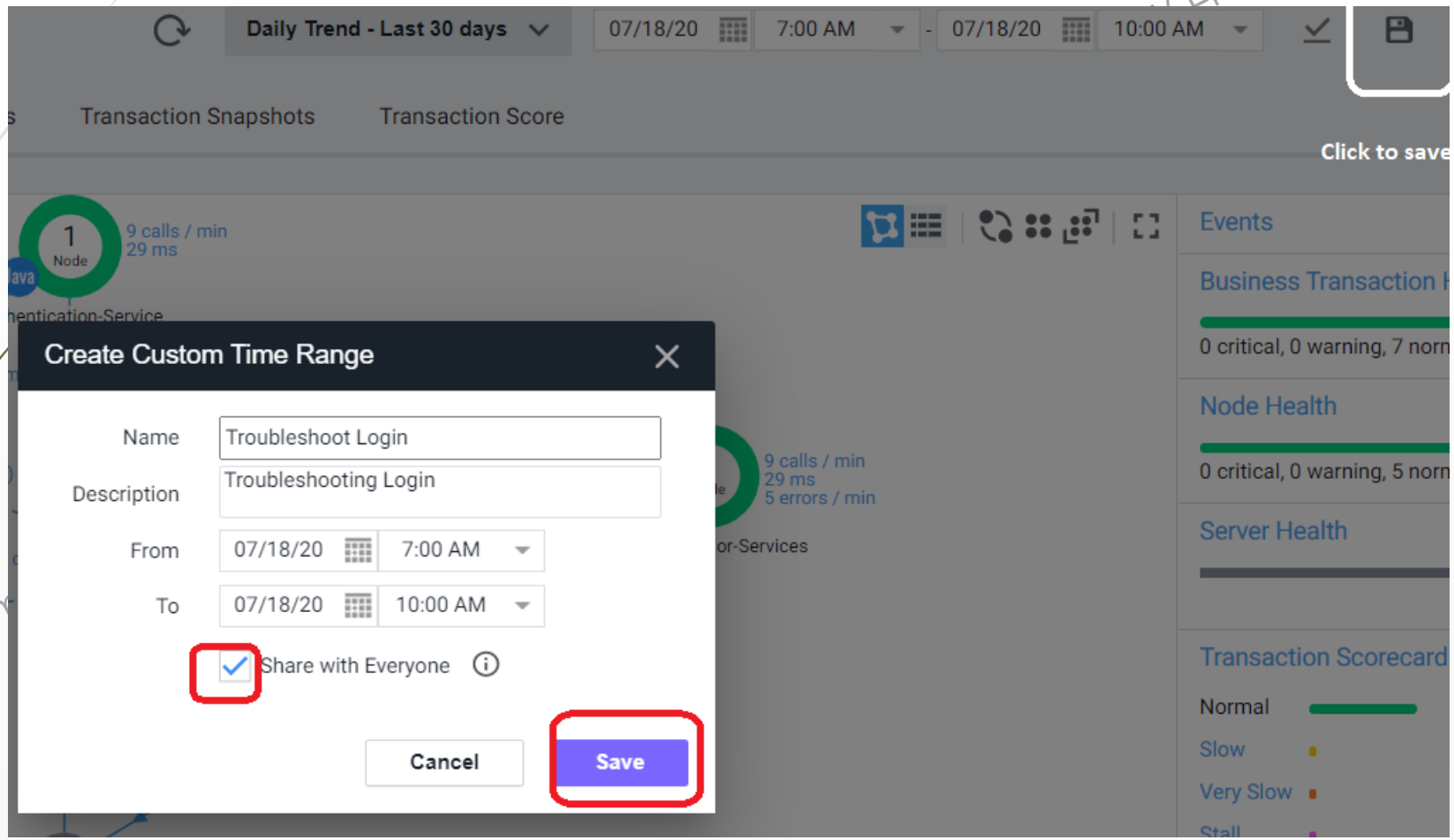
Select the previous day 7:00AM – 10:00AM (Note that you should have had the environment running for more than 24 hours to have this data)



AppDynamics Application Dashboard – **Customize Flow Map**

Exercise 2 – Customize Time of Period Evaluation - Instructions

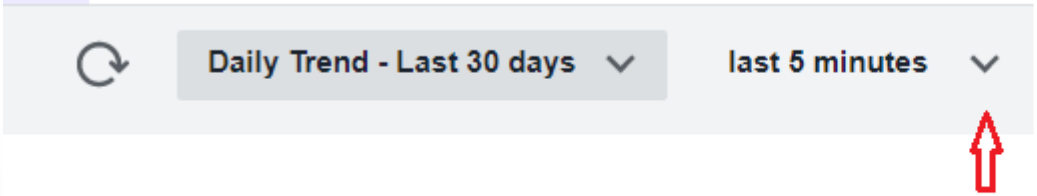
Click the save button at the top of the screen then select "Share with Everyone" and click save button highlighted



AppDynamics Application Dashboard – **Customize Flow Map**

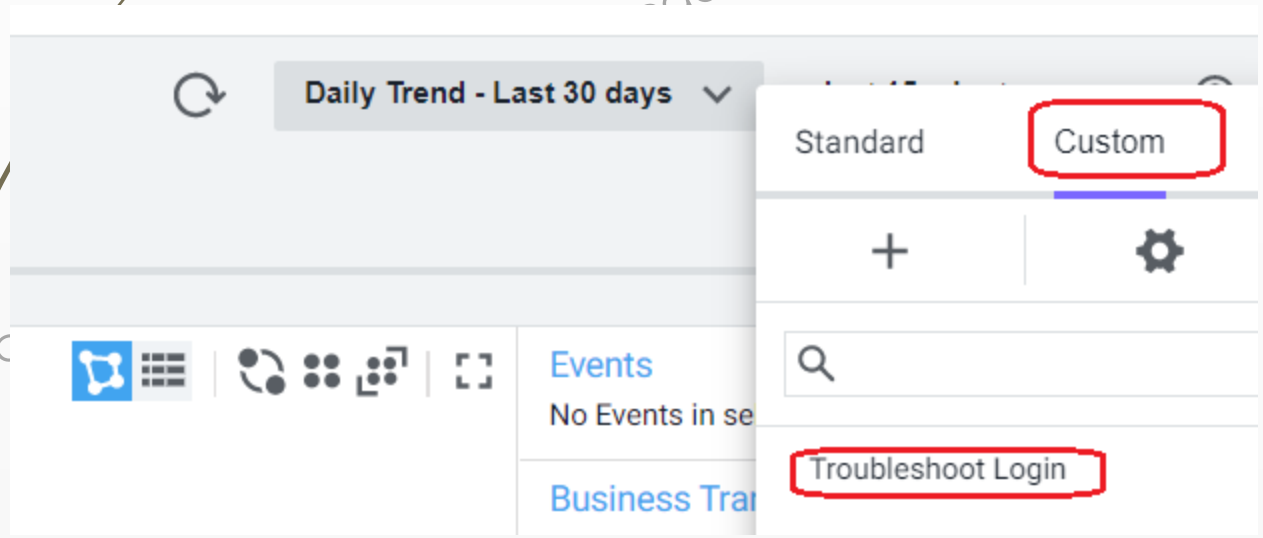
Exercise 2 – Customize Time of Period Evaluation - Instructions

Select the standard and choose last 15mins.



Select the drop down and choose standard and last 15mins to return to how it was before

Click on the drip down, select custom. Did you notice the saved time frame is there? You can always select this for future evaluation



AppDynamics Application Monitoring Structure – Application, Tiers and Node

In AppDynamics your whole application is mapped in a model called **Application**. Application here constitute multiple sub services that work together to form a complete set of functions.

This is not same as what you call application in generic sense in organizations. In customer environment, different team might be responsible for different services but in AppDynamics we group them together as they achieve a common goal.

Example. We have a loan application. Within this application we have other applications or services that handles separate functions. All work together to provide comprehensive loan service. E.g

1. Loan processing engine – processes approved loan
2. The approval services
3. The Portal – The webpage people login to apply for loan
4. The authentication service – People authenticate to get access
5. The verification service –This verifies your loan request to ensure it meets standard requirement

In AppDynamics, all are grouped under one application but each functions listed above (1-5) are grouped further down to separate **tiers**

Tiers – Tiers are logical grouping of services doing the same thing. So if you have two servers handling web request (Portal service) for high availability, both will be grouped under Portal Tiers while each server within the tier is considered a node.

AppDynamics Application Monitoring Structure – Application, Tiers and Node

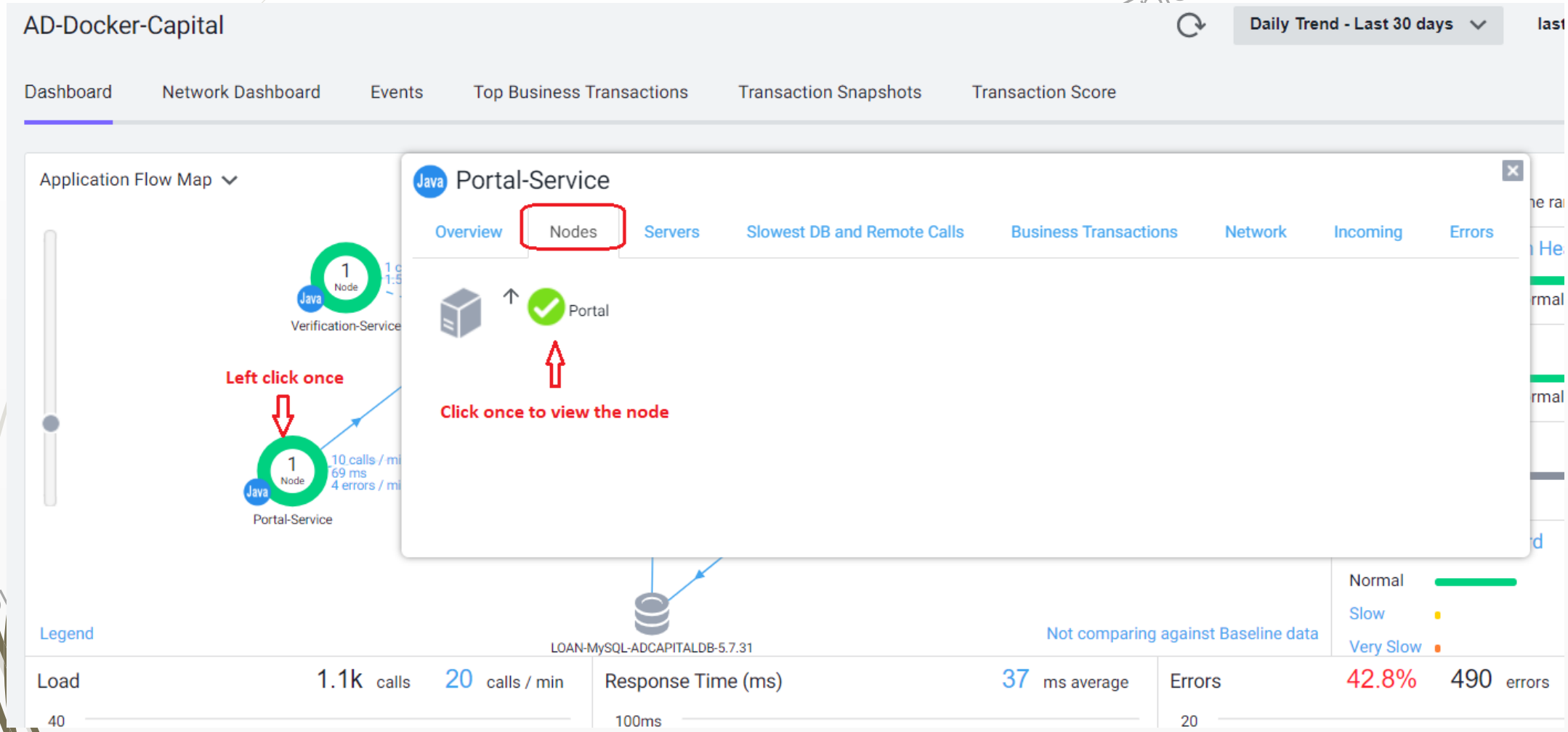
The major reason for this separation is so that you can understand how these services interact and for ease of troubleshooting

AppDynamics uses **Tiers** as a **logical** entity that AppDynamics uses to **organize set of nodes** that work together

AppDynamics Application Monitoring Structure – Application, Tiers and Node

Click through to view the node properties for the portal Tier – The **portal Service** tier has **only one node**.

Left Click once and select node

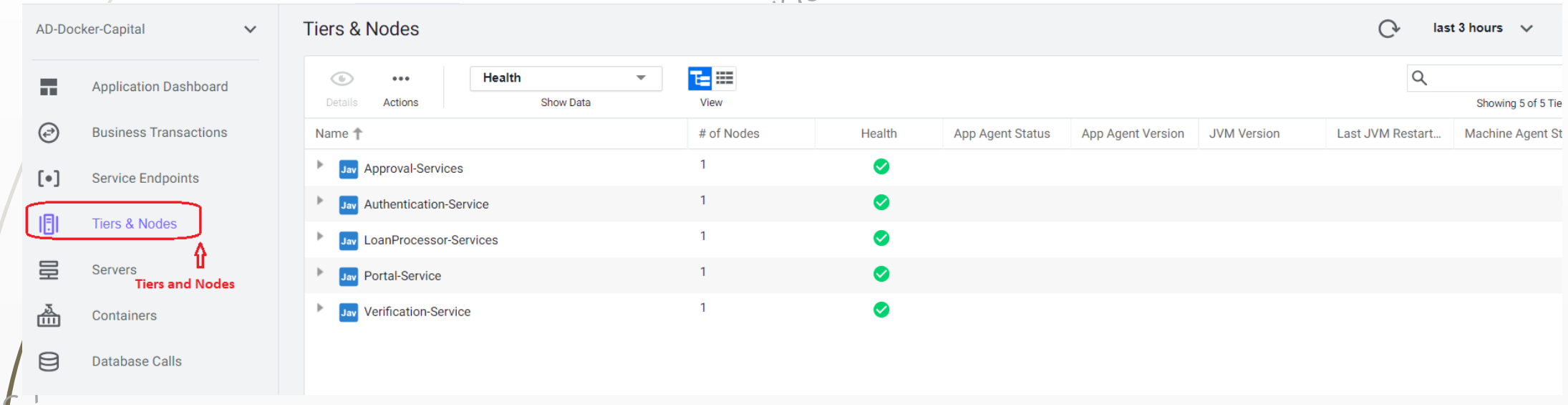


AppDynamics Application Monitoring Structure – Application, Tiers and Node

Exercise 3A – Identify Tiers and Nodes basic metrics

You can also view the tiers and node from the left side pane. What do you see?

1. How many tiers did you see?
2. How many nodes per tier did you notice?

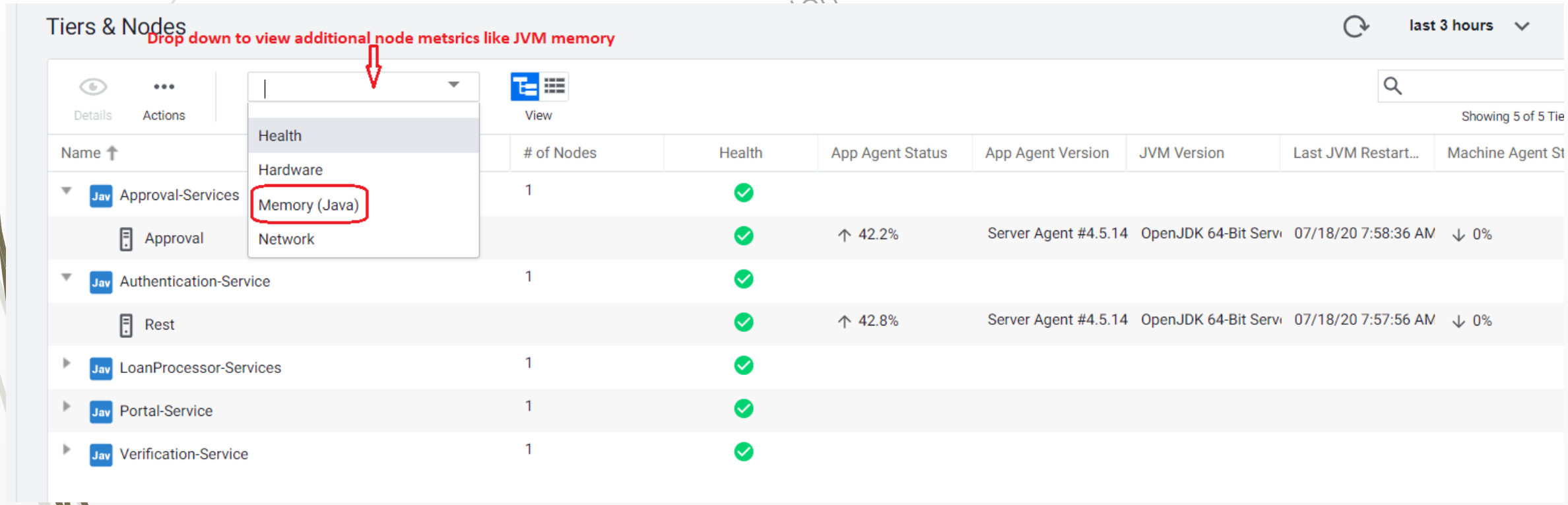


AppDynamics Application Monitoring Structure – Application, Tiers and Node

Exercise 3B – Identify Tiers and Nodes basic metrics

Drop down and select Memory(Java) and Hardware to view additional node metrics

1. What is the node with the highest JVM heap utilization?
2. What is the node with highest CPU utilization? #No data will be seen (**hardware**) as machine agent is not installed yet



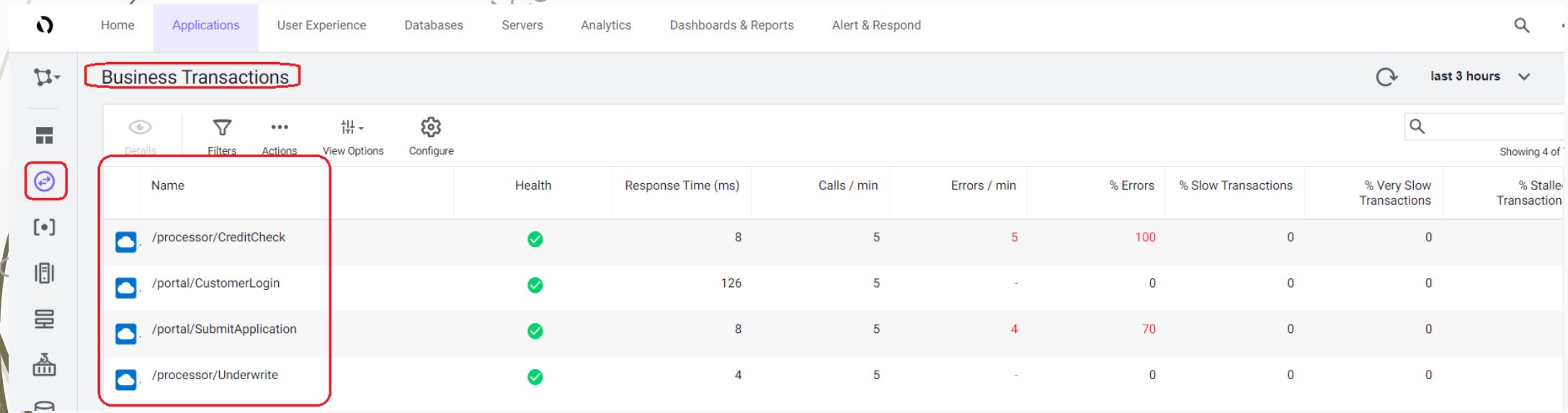
AppDynamics Business Transaction

AppDynamics Business Transaction represents distinct user interaction or activity within your application.
E.g Authentication, Login, checkout, paybills etc.

AppDynamics uses a tag and follow mechanism to monitor activities across distributed application eco system. For an online banking environment, all activities involved in transferring money from your bank to another bank will be grouped as **one business transaction** which might include

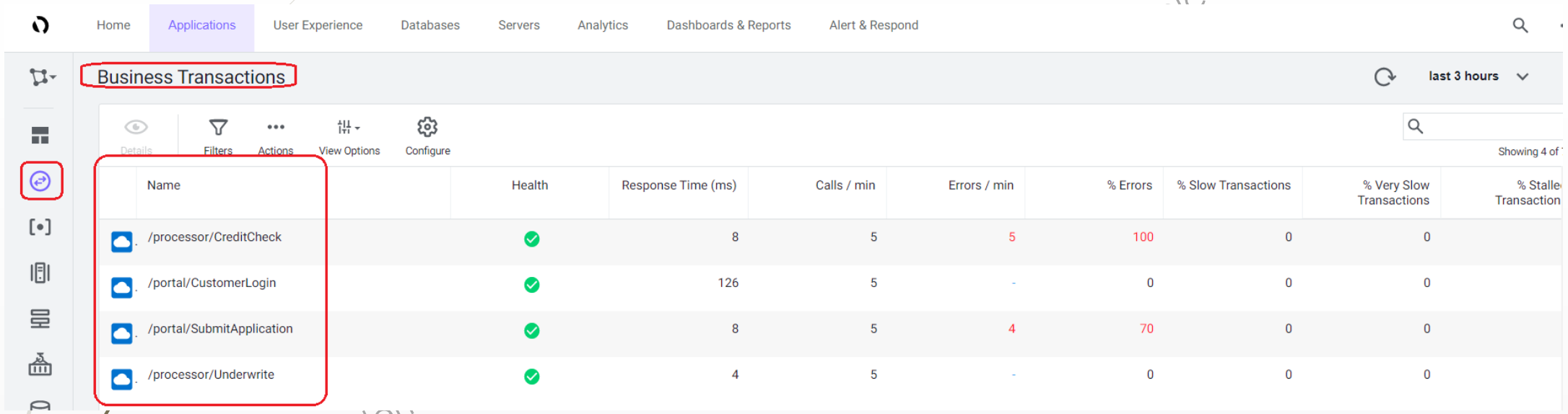
1. Check senders account balance to be sure there is sufficient balance
2. Check the receiver's banks availability
3. Actual sending of the money to destination bank

Click on the Business transaction (**BT**) by your left pane highlighted below to view. Notice Health,Response Time (ms), Errors/min, % Errors, % Slow Transaction etc.



AppDynamics Business Transaction

Click on the Business transaction (**BT**) by your left pane highlighted below to view. Notice Health,Response Time (ms), Errors/min, % Errors, % Slow Transaction etc.

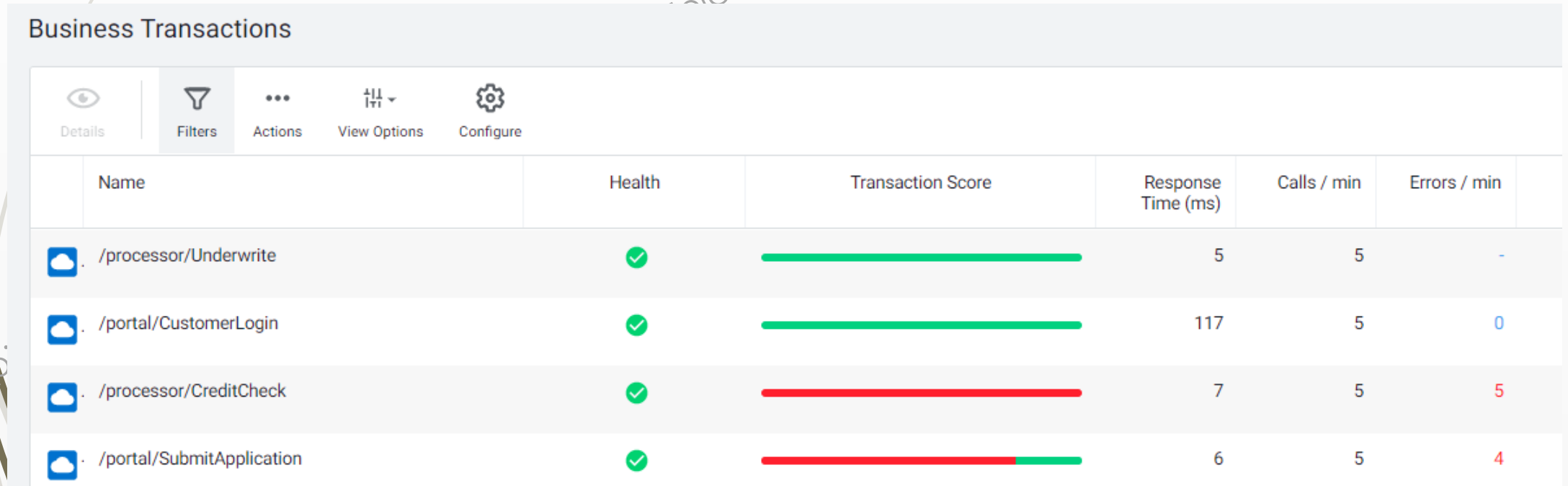


AppDynamics Business Transaction

Exercise 4A. Business Transaction Classification- Instruction

Scenario: As an AppDynamics performance analyst you have been invited to access how a application user interaction has been performing . Access the Flow Map page and select the Top Business Transaction and answer the following question;

1. Which business transaction has the highest error rate % in the last 12 hours? ----------
2. Which business transaction has the highest number of request/min in the last 12hours?----------
3. Which business Transaction has the highest response time in the last 12 hours? ----------
4. Adjust the Business transaction page to show additional information like the "Transaction Score Card" What feature on the page did you to show this? Transaction score card should show as below..

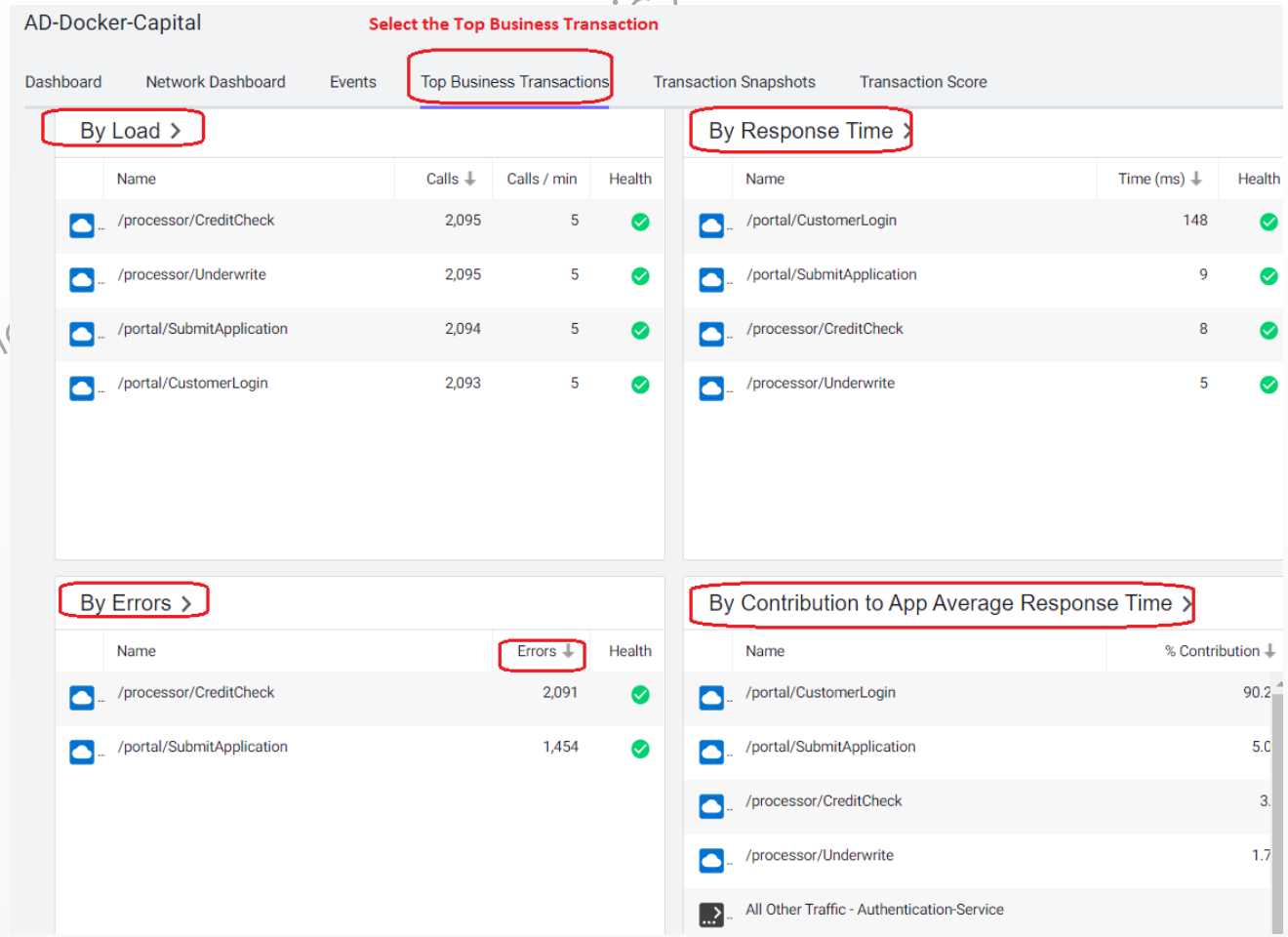


AppDynamics Business Transaction

Exercise 4B. Business Transaction Classification- Instruction

Use the Top Business Transactions and list the following

1. The BT with the highest Load is ----------
2. The BT with the highest Error is ----------
3. The BT with the highest Response time is ----------



Baselines

A baseline provides an established point of reference against which performance is measured. Dynamic baselines are based on observed performance over time. Static baselines are based on specific values.

Baselines can be used to identify

1. Transaction outliers
2. Health analysis data of business transactions, nodes, tiers and application

Baselines are used to trigger events, alerts whenever there is a deviation from either a set static or dynamics baseline.

Real world Scenario: After onboarding AppDynamics in your application, you may have say 14 – 15 days excellent performance. You can use that period and set a baseline which will form a reference point going forward.

Tip: Note that if you choose a baseline period that the application had performance issue – errors, high response time…That will mess up your baseline data.

Baselines

Exercise 5: Configure Baseline

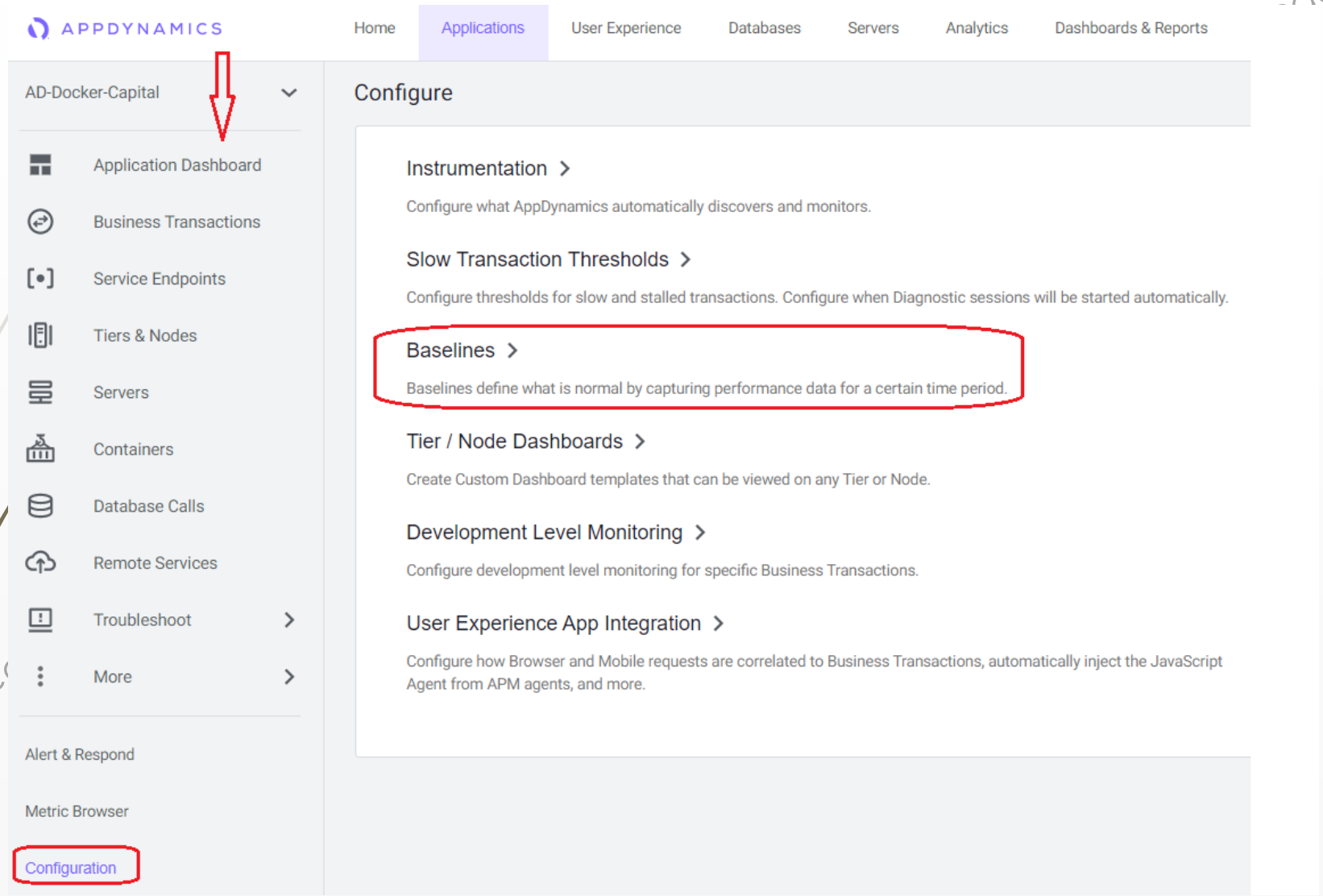
Scenario

As a performance analyst, configure baseline data for the last 1-day data that you have on your AD Capital Application.

Name your baseline - **Last1Day-Baseline**

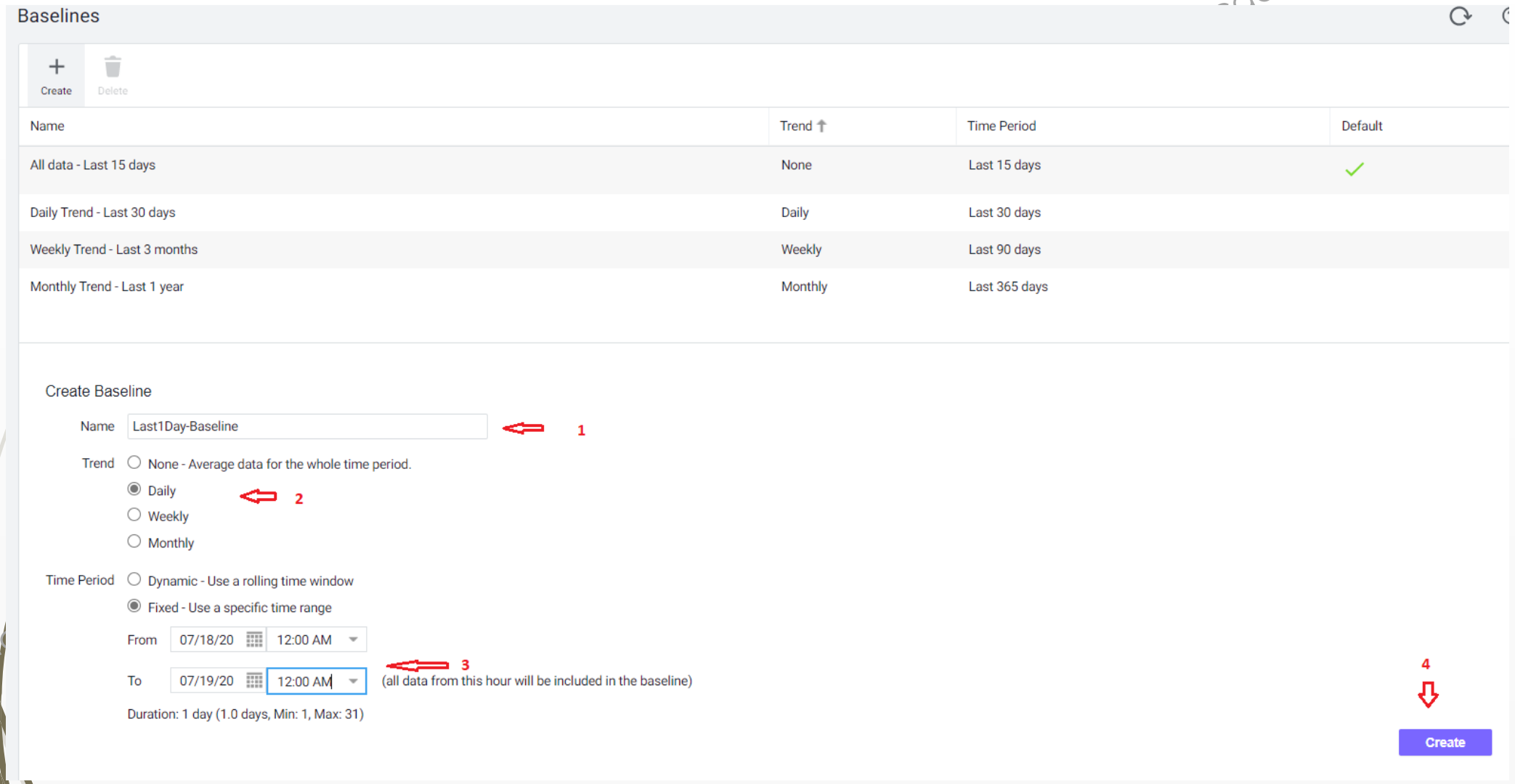
Baselines

From the AppDynamics UI left pane, Create a new baseline by selecting Configuration and Baselines



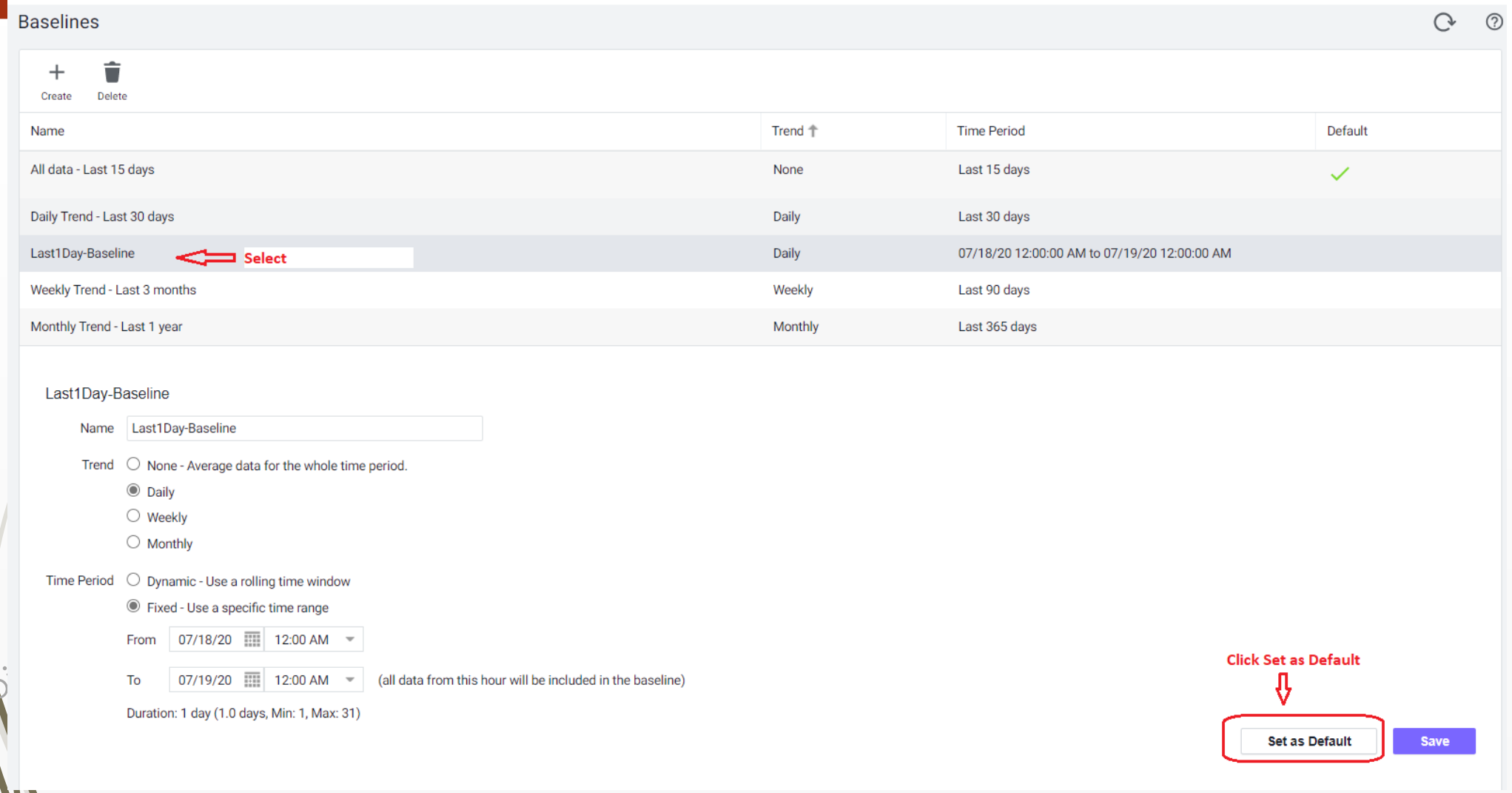
Baselines

Select Fixed Period, Name the baseline, Select Daily and create



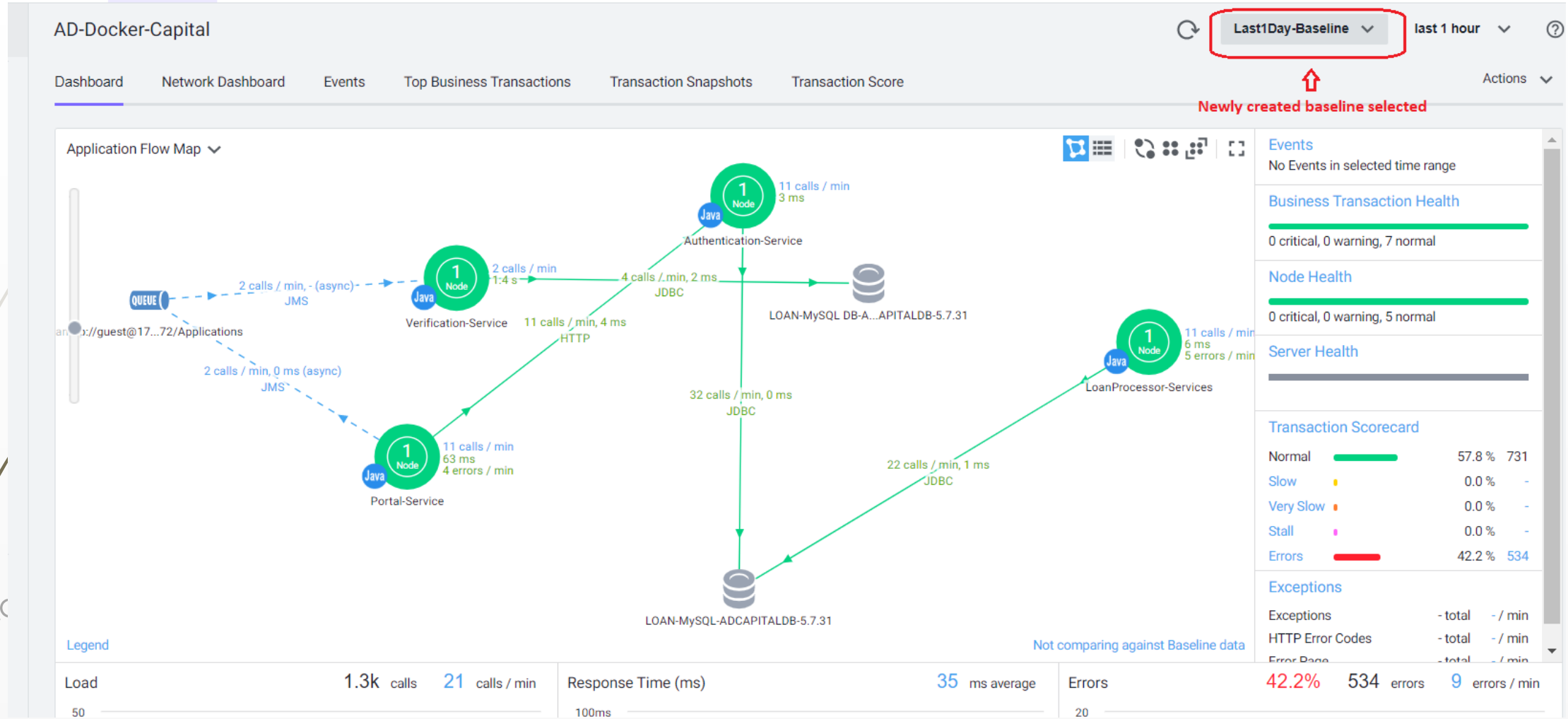
Baselines

Once created, select the newly created baseline and click "Set as Default" and save



Baselines

Go back to the AppDynamics UI Flow map and see that this gets selected as the baseline automatically

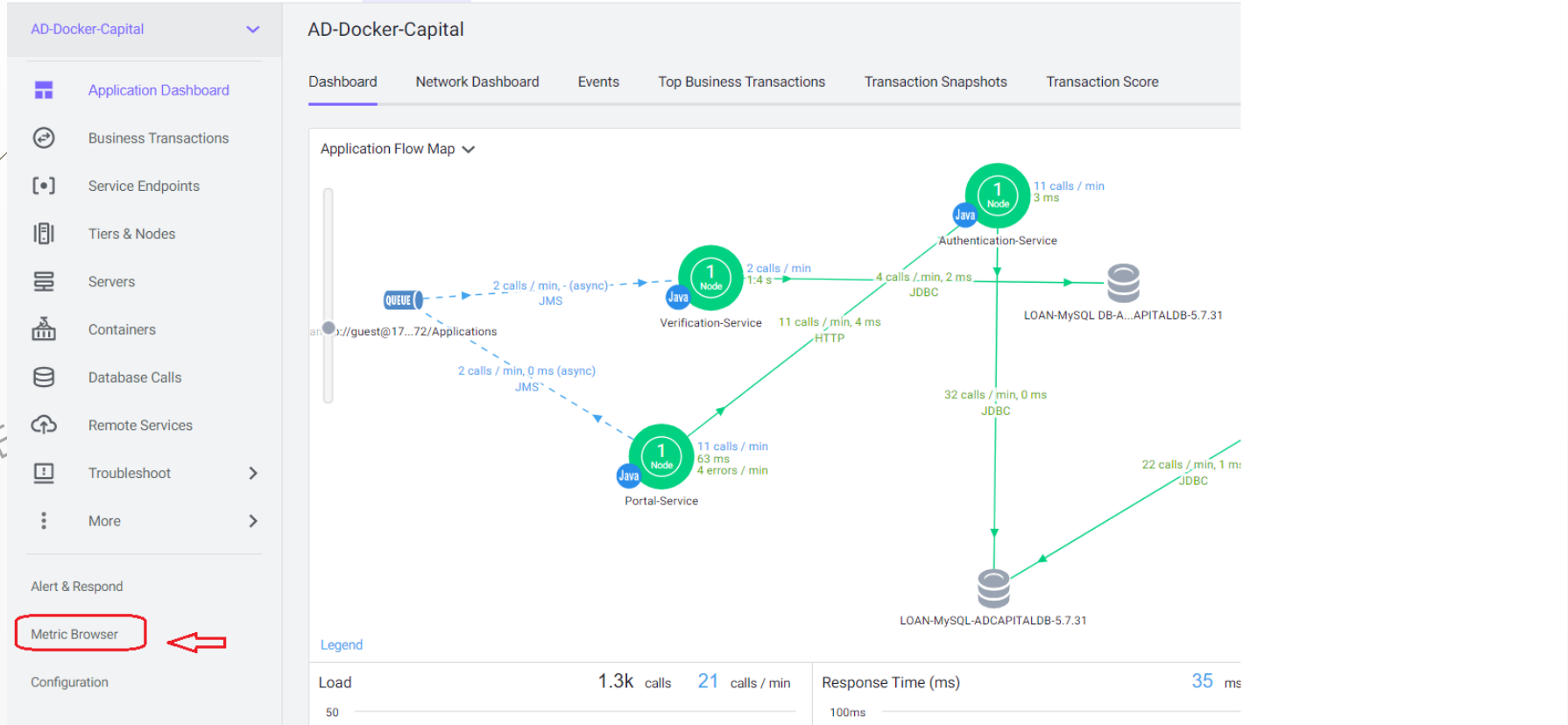


Baselines – Compare baseline with current performance metric

Using **AppDynamics Metric browser** – You can view application metrics with respect to set baseline.

AppDynamics Metric browser is a rich interface to use to view different metric data that you cannot ordinarily view else where.

Access the metric browser by clicking on the metric browser tab by the left pane.



Baselines – Compare baseline with current performance metric

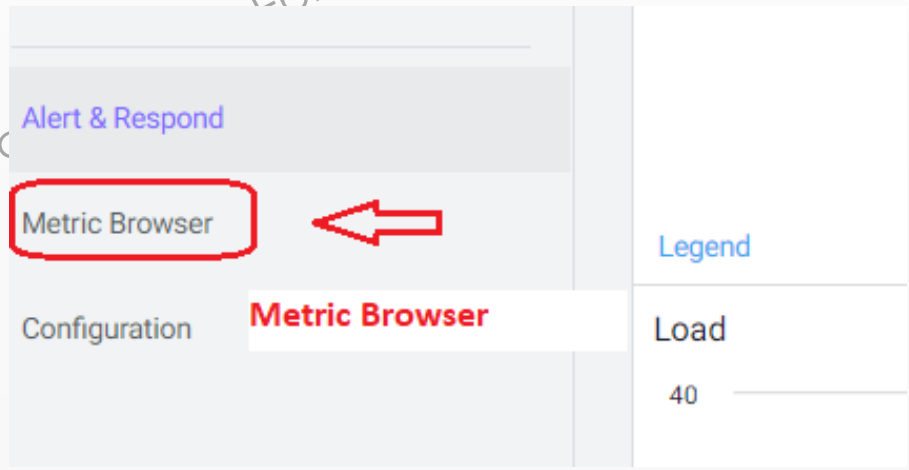
Exercise 6: **Using the Metric browser View the AD Capital Customer Login Business Transaction Average response time in the last 1 hour and answer the following;**

1. What is the baseline for the last one hour?

2. What is the current highest average response time with respect to a one-hour trend ?

3. Is customer login performing above or below the baseline from an average response time perspective.?

4. What is the Overall Application Performance Average Response time? Use metric browser to locate this.

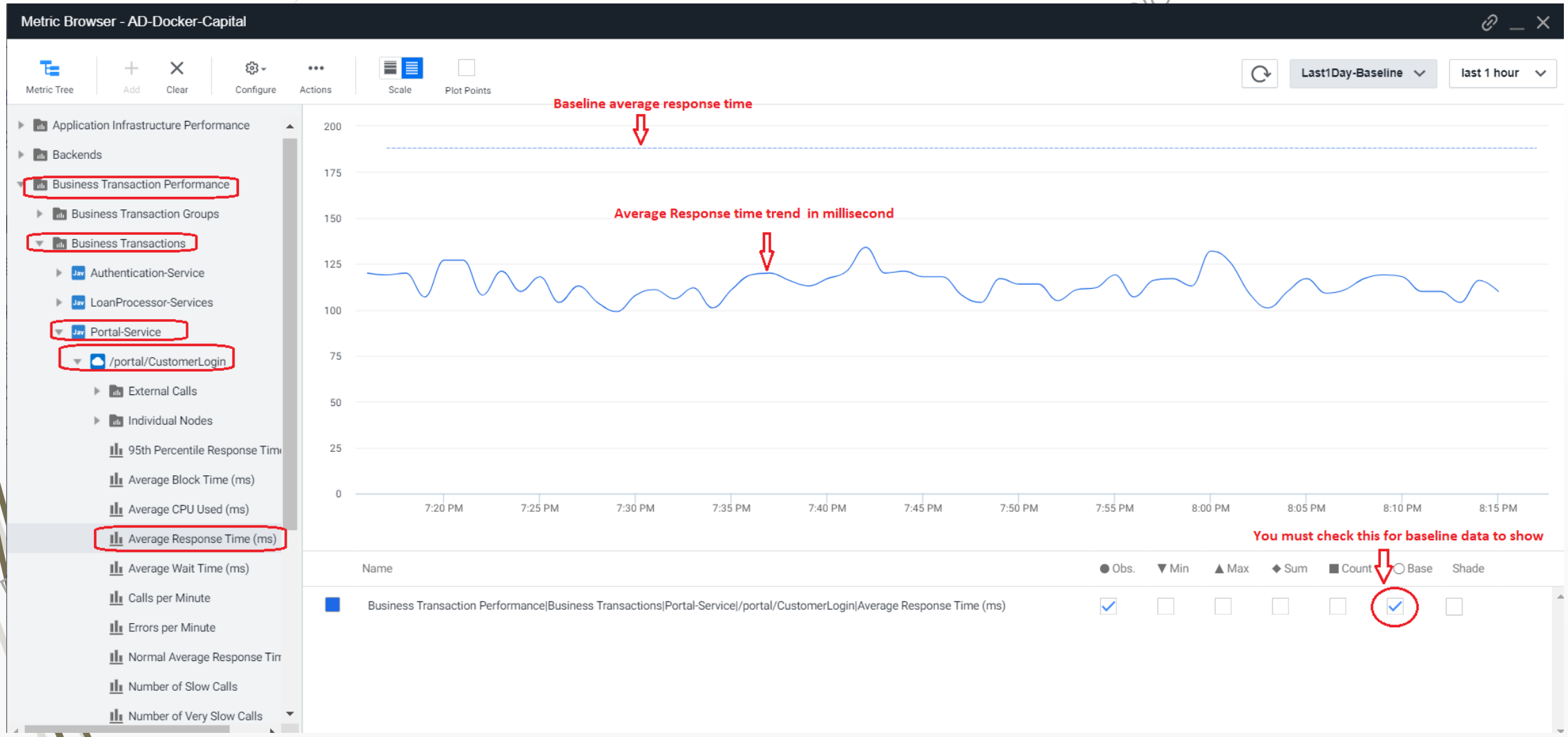


Access the metric browser from main tab

Baselines – Compare baseline with current performance metric

Exercise 6: Baseline - Instruction

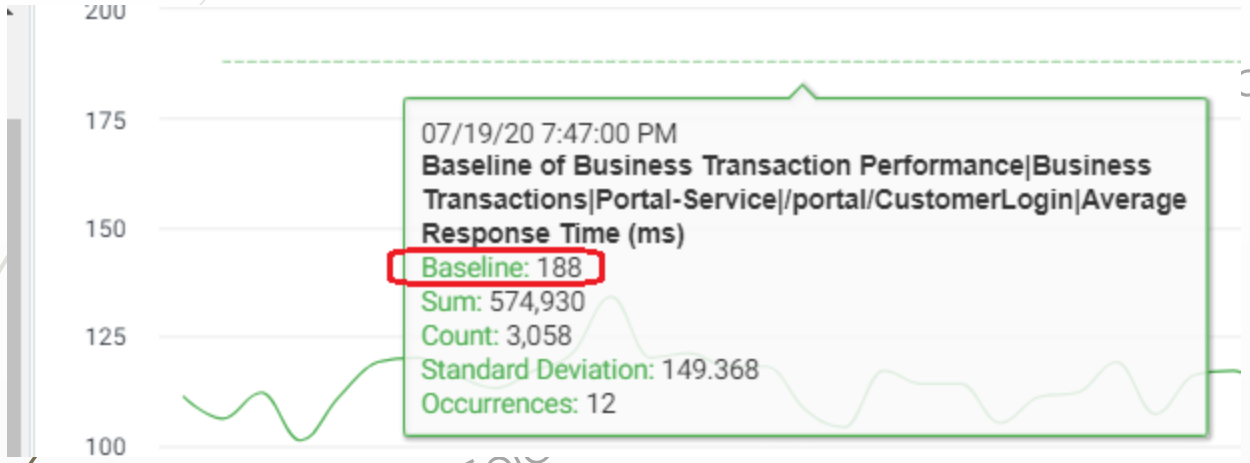
Click on the metric browser and select business transaction Performance > Business Transaction > Portal Service > /portal/Customer Login and then select average response time

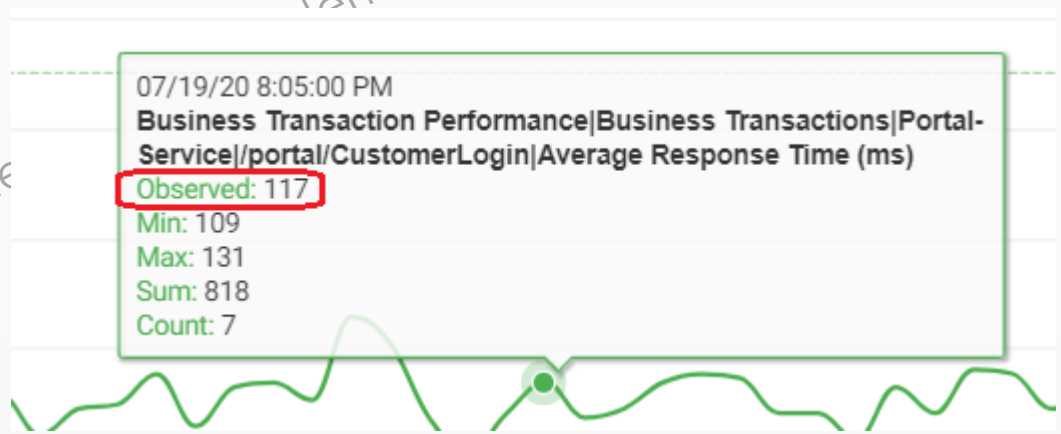


Baselines – Compare baseline with current performance metric

Exercise 6: Baseline - Instruction

Hover your mouse and notice the Baseline and observed values. Observed value is the current average response time value while Baseline is the learnt baseline.

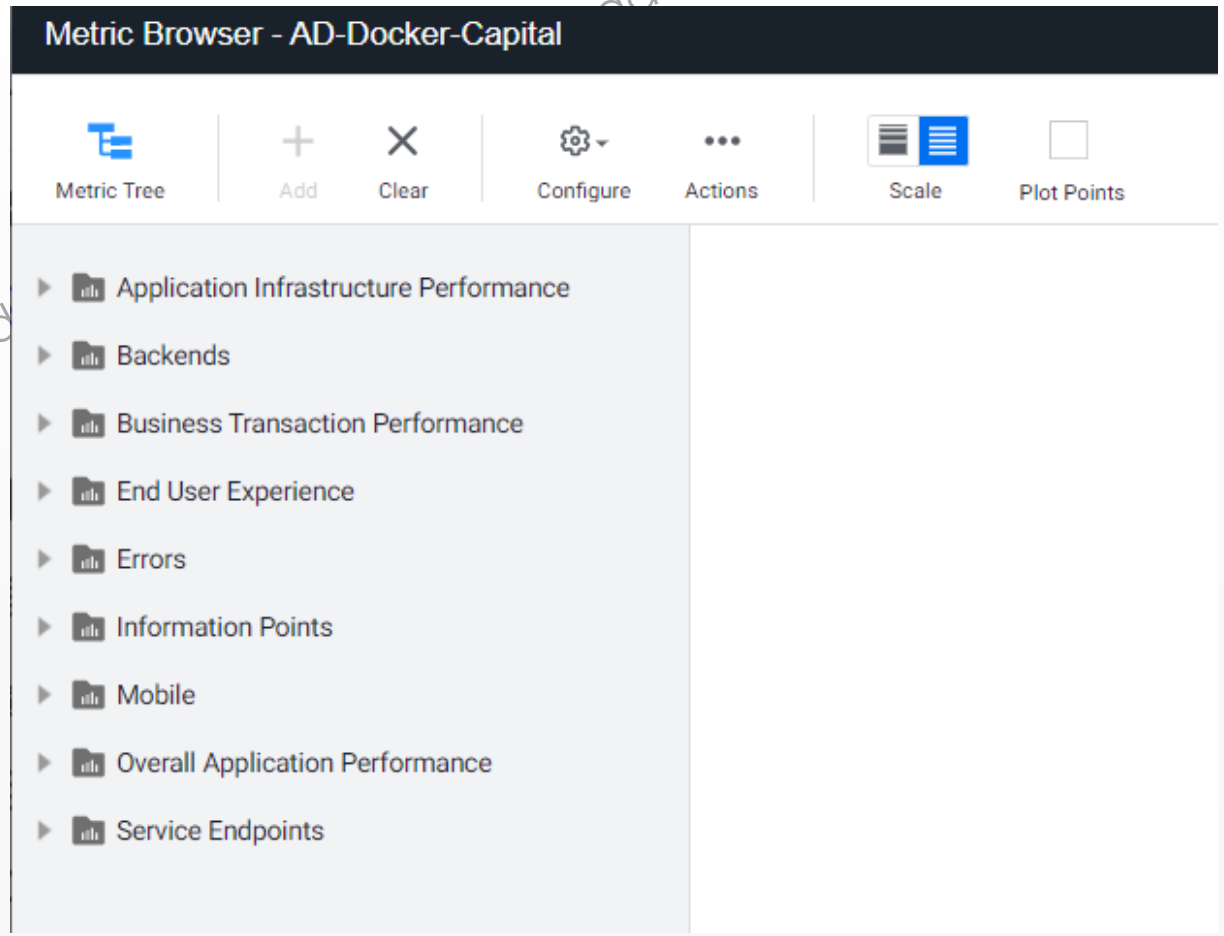




Performance Metrics

AppDynamics agent picks up performance metrics (e.g response time, errors, CPU usage etc) of an application or node and report same to AppDynamics controller.

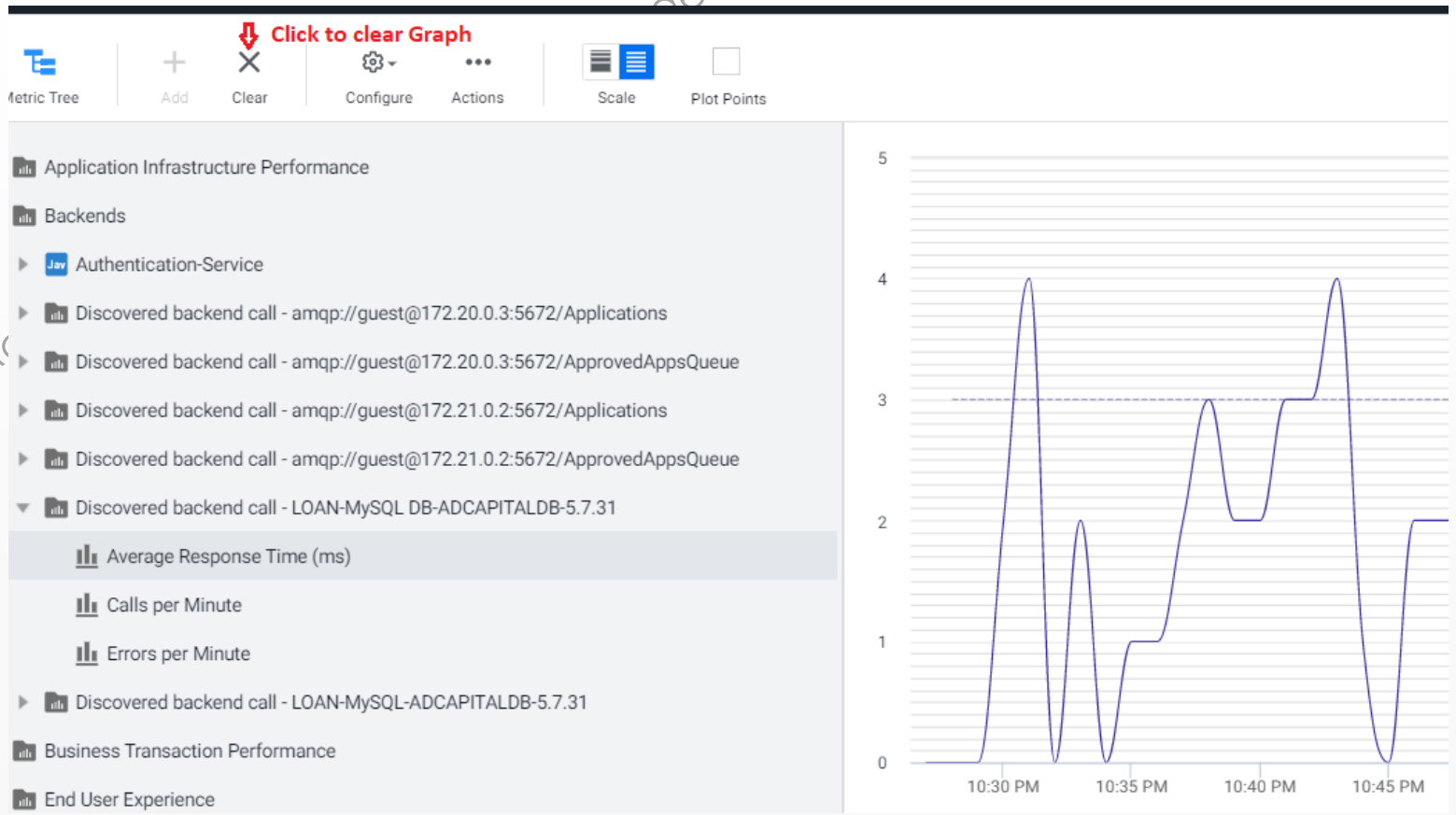
Application agent picks performance about the application while machine agent picks information about the underlying server infrastructure.
These metrics can be viewed with metric browser. See data available. Click on the Metric browser again to see what data is available.



Viewing Performance Metrics – Metric Browser

You can view the following with metric browser

1. Application Infrastructure Performance
2. Backends
3. Business Transaction Performance
4. End User Experience
5. Errors
6. Information Point
7. Mobile
8. Overall Application Performance
9. Service Endpoints



Diagnostic session and Snapshots

Diagnostic session in AppDynamics allows to capture detailed transaction data which is called snapshot. Diagnostic session can be captured over a defined period and gives you rich business transaction data that will be helpful for both analysis or troubleshooting of a performance problem.

Two types of diagnostic session is available within AppDynamics

1. **Manual**
2. **Dynamic or Automatic** (Based on events or based on default configurable schedule within AppDynamics)

In summary we collect diagnostic data which contains business transaction snapshots.

Diagnostic session and Snapshots

Review the default diagnostic session configuration in AppDynamics

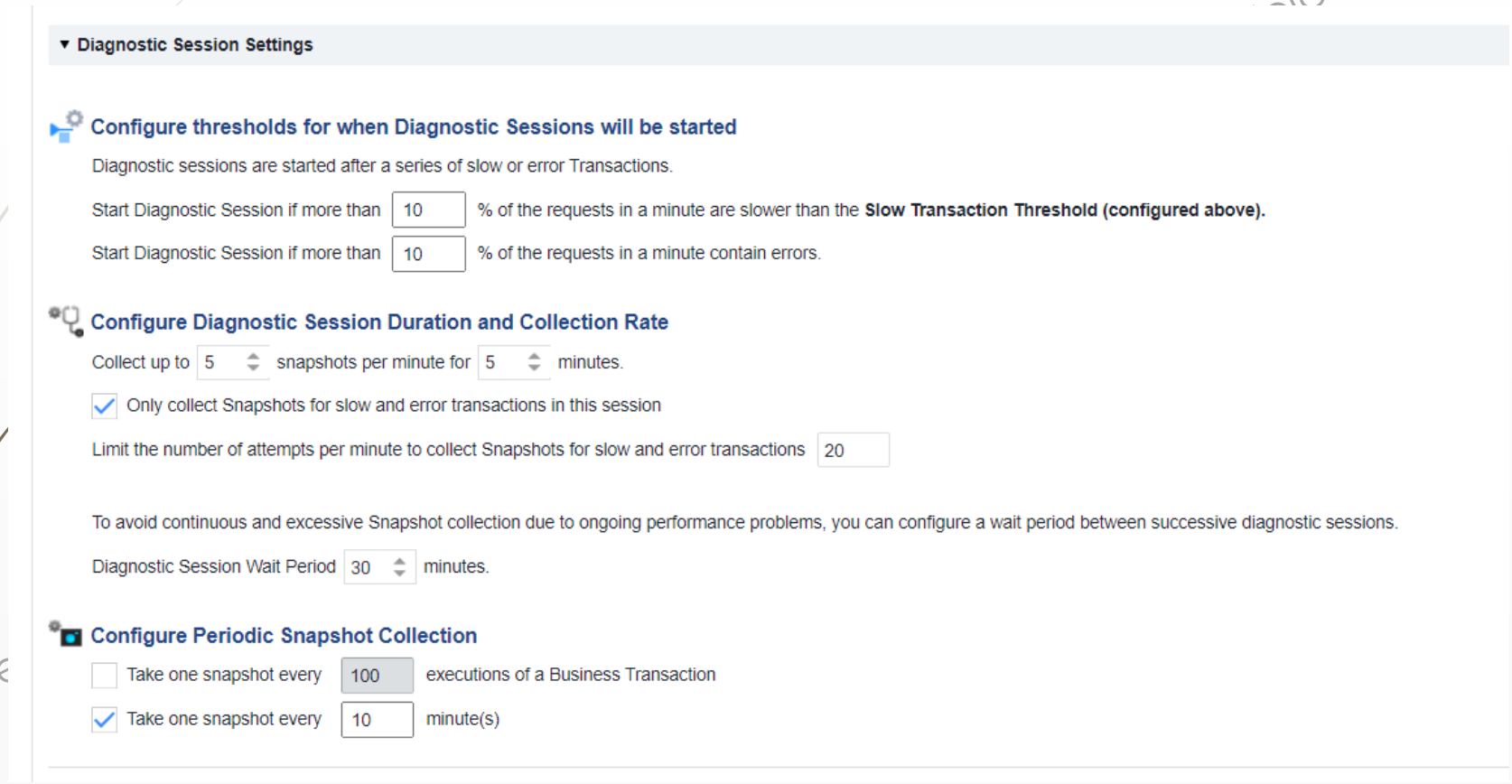
Go to Configuration > Slow Transaction threshold and scroll to Diagnostic session setting

Exercise 7 – Answer the following question

1. What is the default number of snapshot per minute that gets collected and for how many minutes does this run.
2. For periodic snapshot, how many periodic snapshot is taking by default and for how many minutes?

Diagnostic session and Snapshots

Your Answer will look like the below screenshot. Example, If more **than 10%** of requests are slower than the threshold, Automatic diagnostic session starts etc.



Diagnostic session and Snapshots

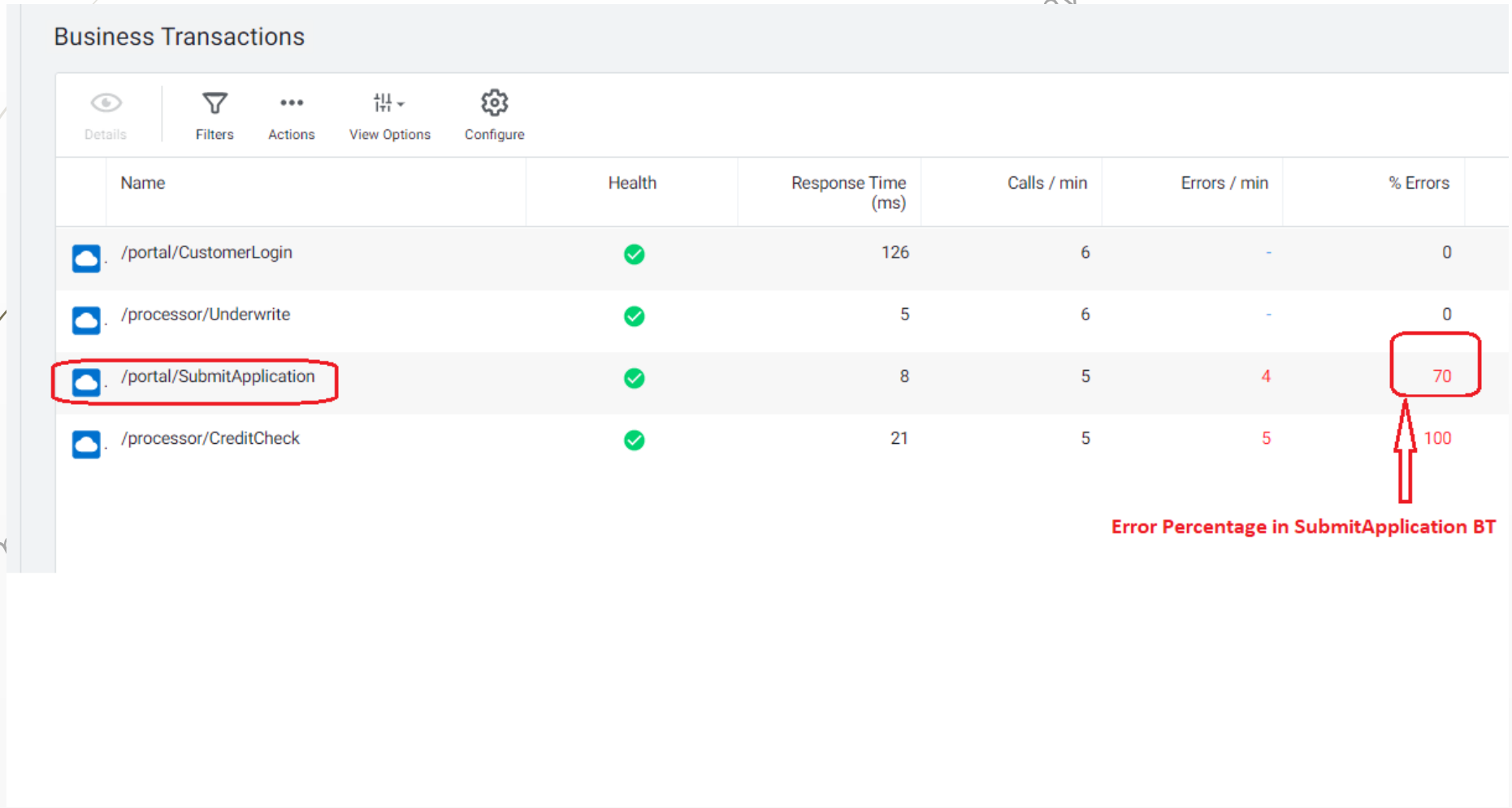
Exercise 8 – Scenario – Diagnostic session

As the performance analyst of your organization, you noticed a certain error percentage in the /portal/SubmitApplication Business transaction of AD Capital application. However, when you open the snapshots created dynamically you don't seem to have a lot of data for analysis. Collect **manual diagnostic** data for further troubleshooting

Diagnostic session and Snapshots

Exercise 8 – Scenario – Diagnostic session

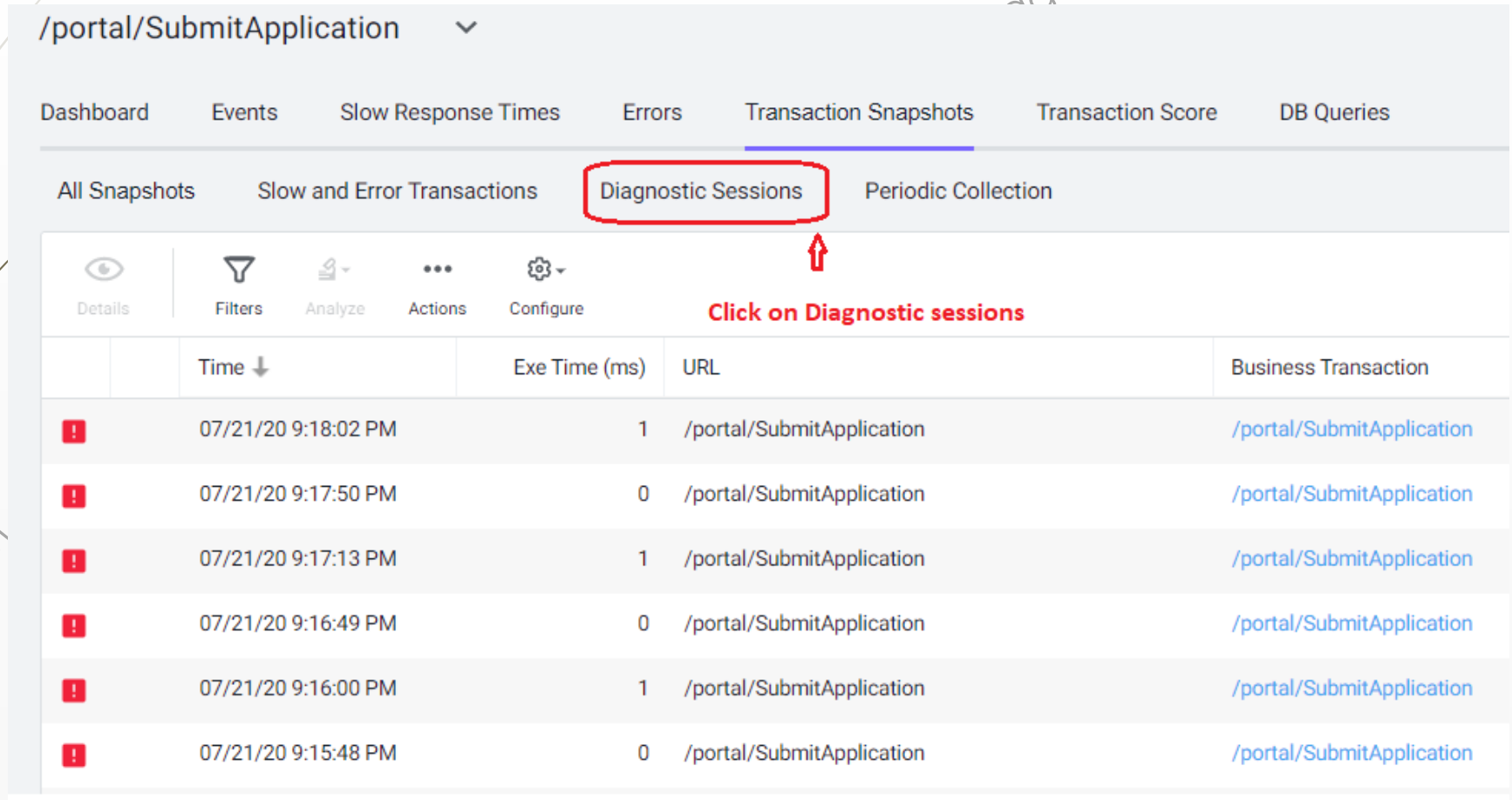
1. Access the Business transaction dashboard and locate the portal/SubmitApplication business transaction with high error percentage.



Diagnostic session and Snapshots

Exercise 11 – Scenario - Instruction

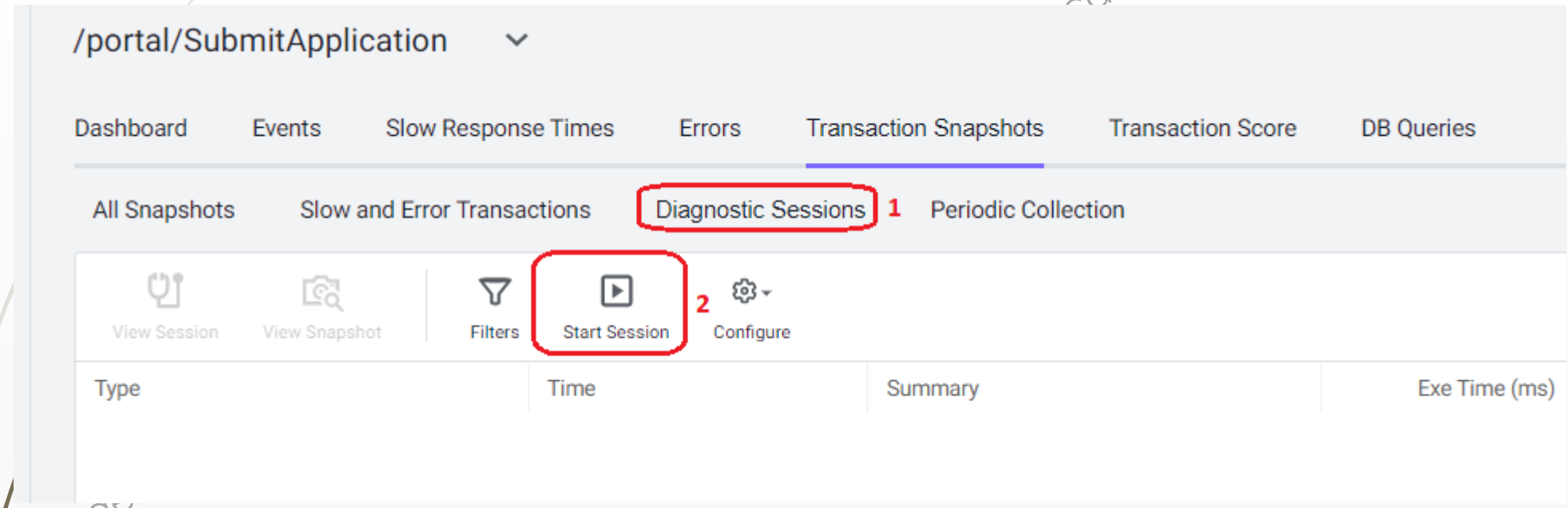
3. While on same page, click on **diagnostic session > Start Session** to begin collecting diagnostic data for the business transaction



Diagnostic session and Snapshots

Exercise 11 – Scenario - Instruction

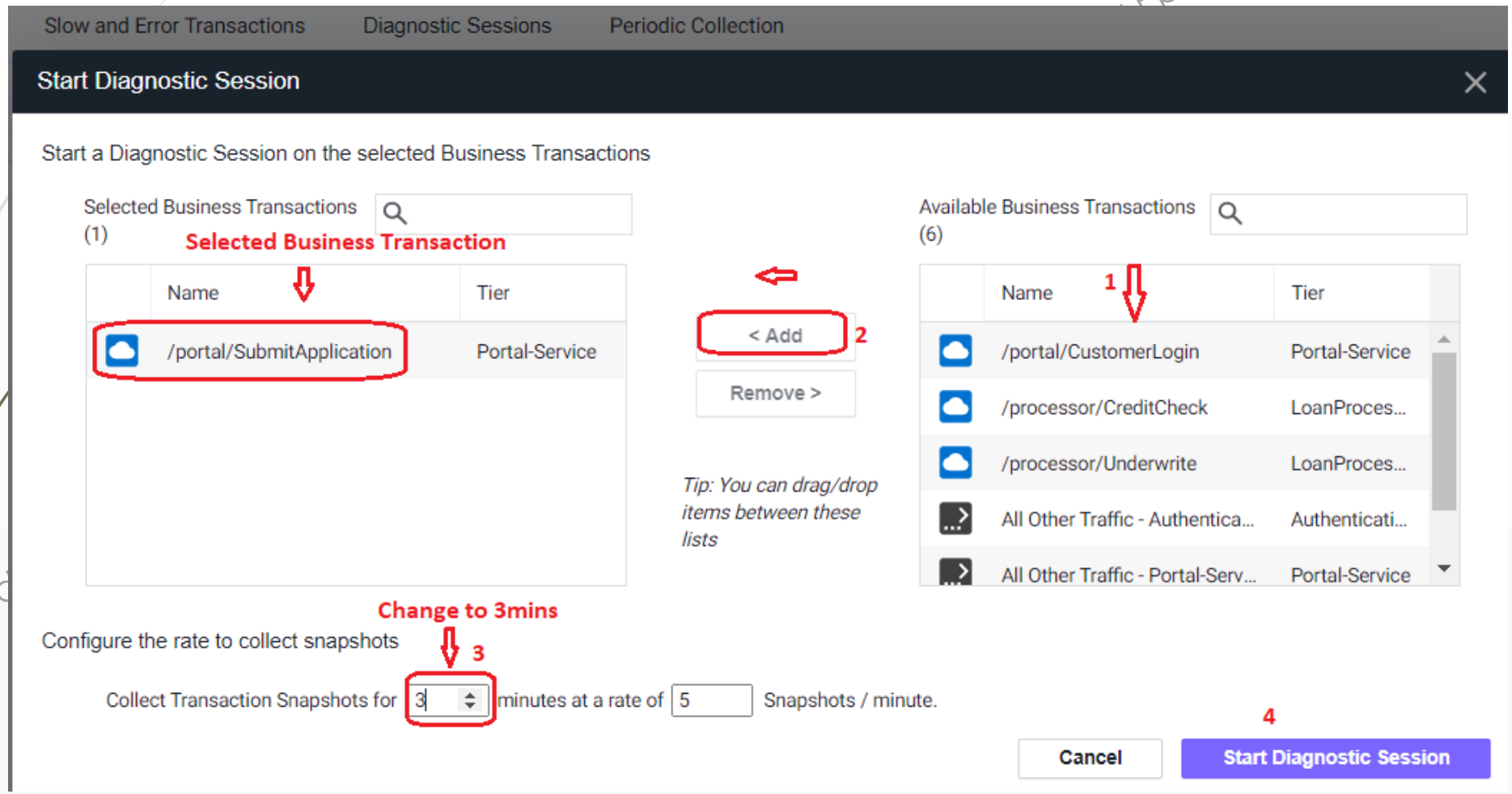
3. While on same page, click on **diagnostic session > Start Session** to begin collecting diagnostic data for the business transaction



Diagnostic session and Snapshots

Exercise 8 – Scenario – Diagnostic session

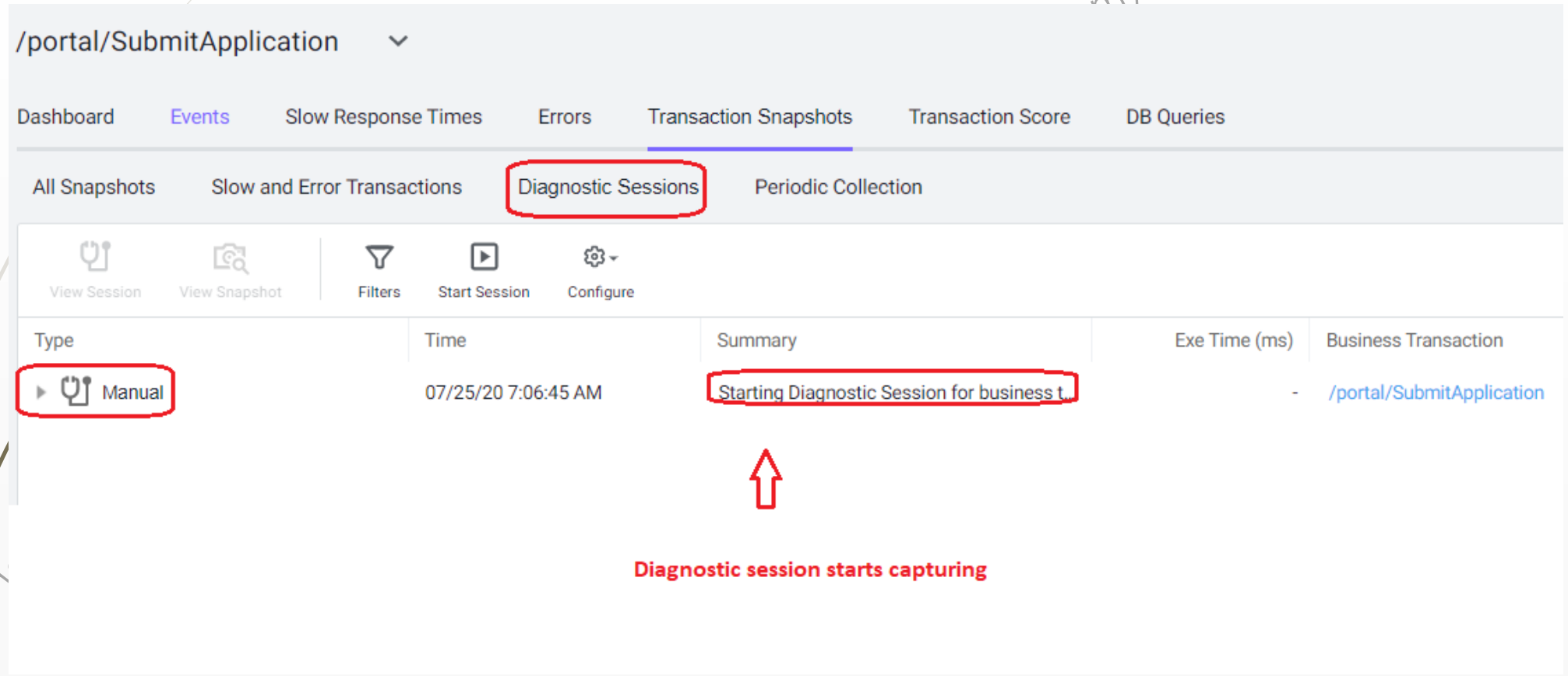
3. While on same page, click on **diagnostic session > Start Session** to begin collecting diagnostic data for the business transaction. When selected, click on start Diagnostic session



Diagnostic session and Snapshots

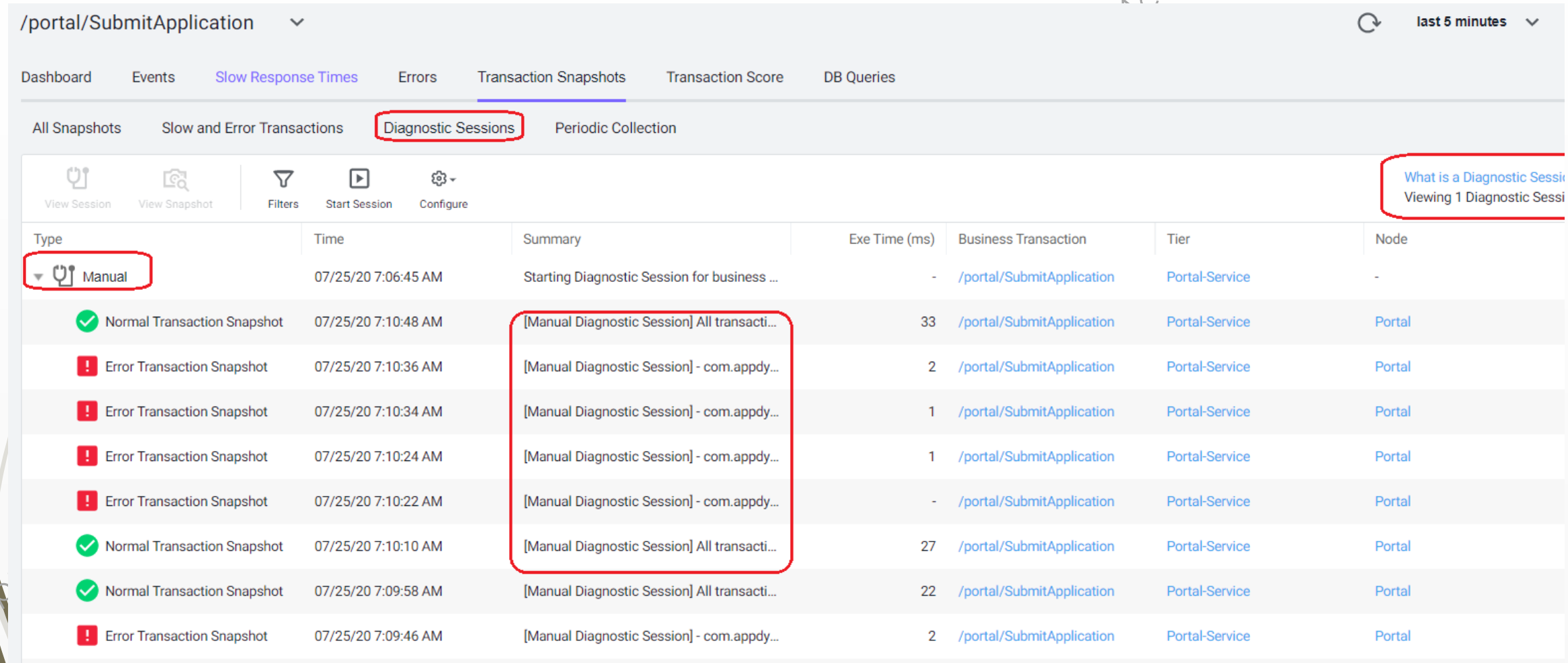
Exercise 8 – Scenario – Diagnostic session

3. While on same page, click on **diagnostic session > Start Session** to begin collecting diagnostic data for the business transaction. When selected, click on start Diagnostic session



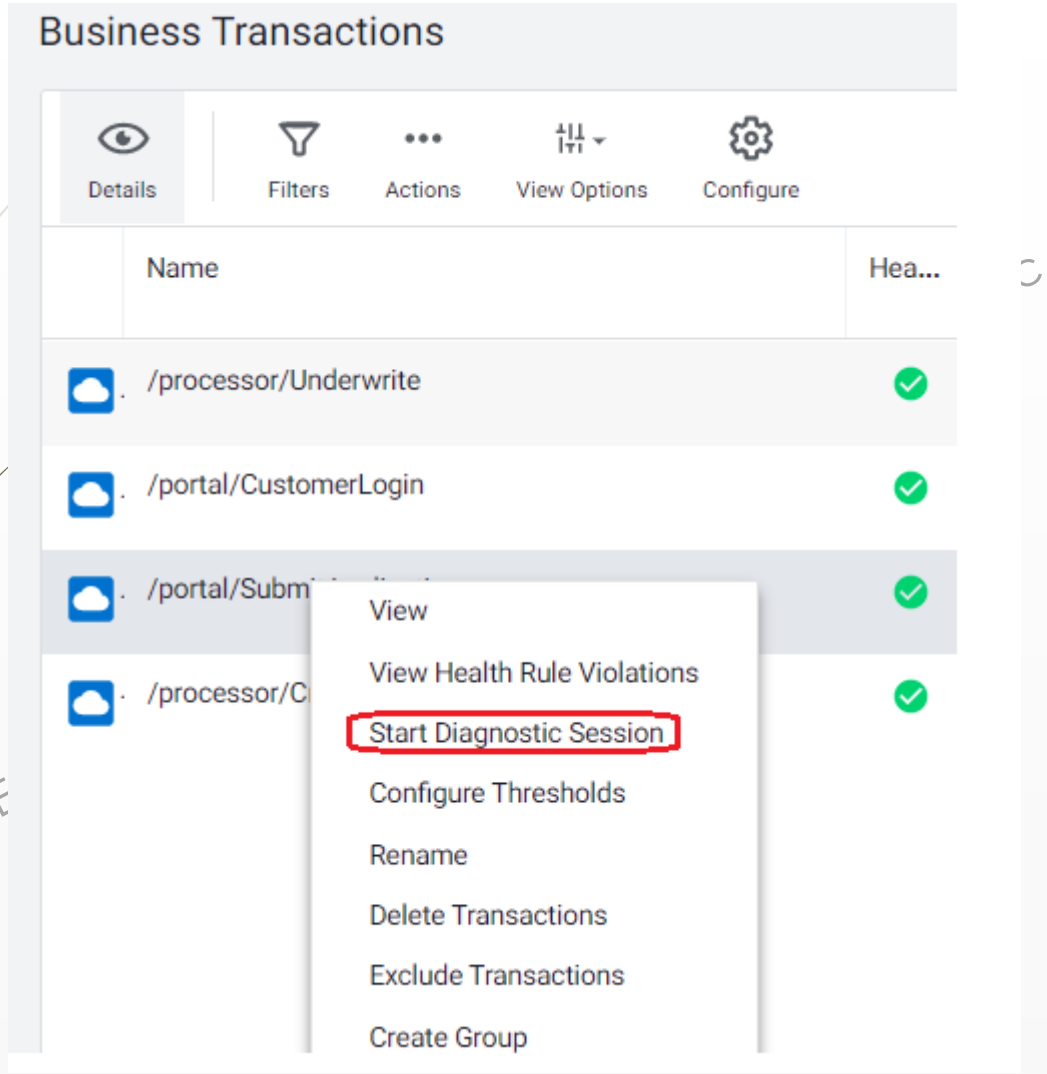
Diagnostic session and Snapshots

After some minutes, you will see a bunch of transaction snapshots,-- Knowledge of this collection will be used in the troubleshooting Module.



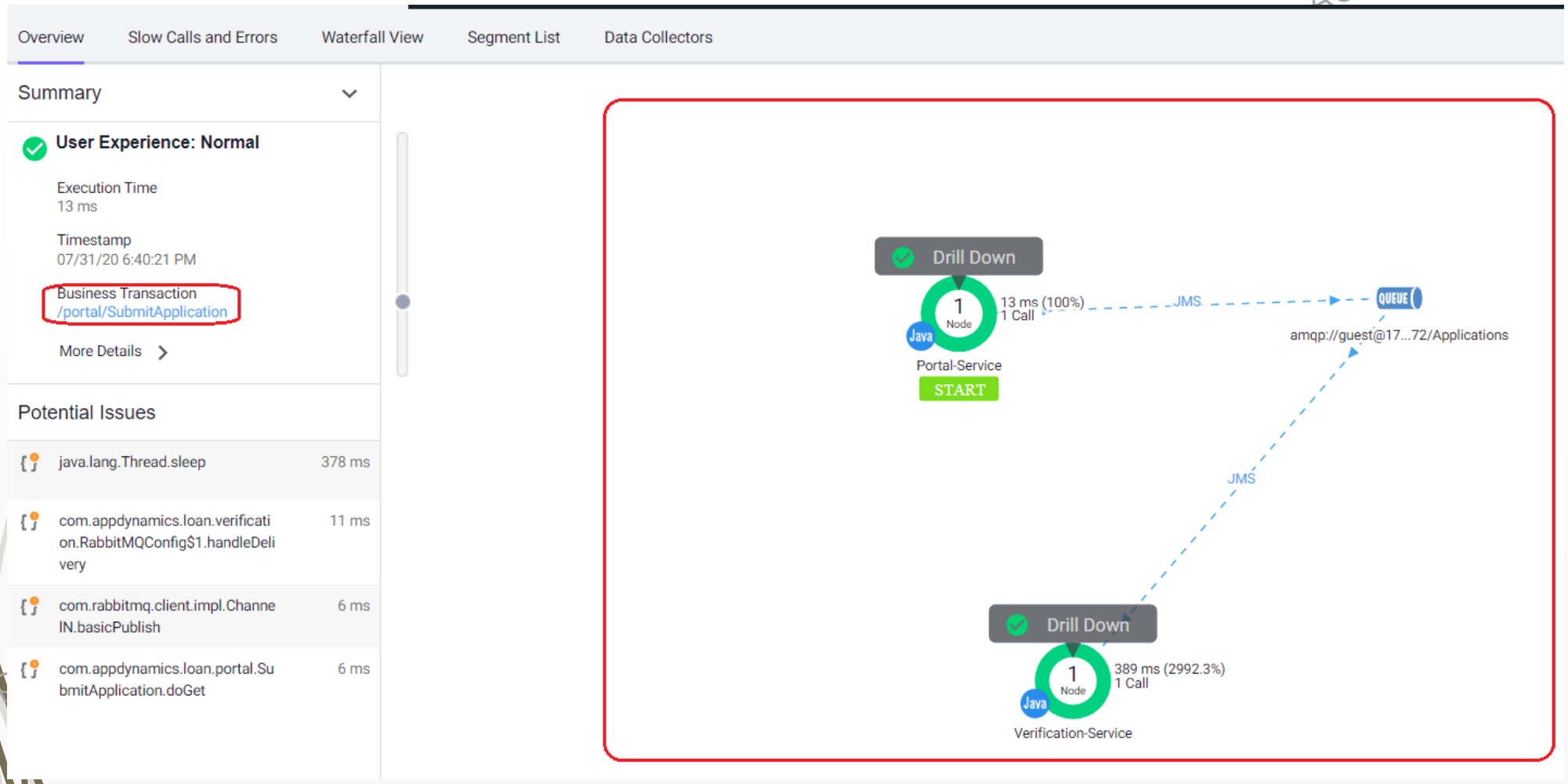
Diagnostic session and Snapshots

You can also right click and select Start Diagnostic Session directly from the business transaction page



Diagnostic session and Snapshots

The below shows Full call graph

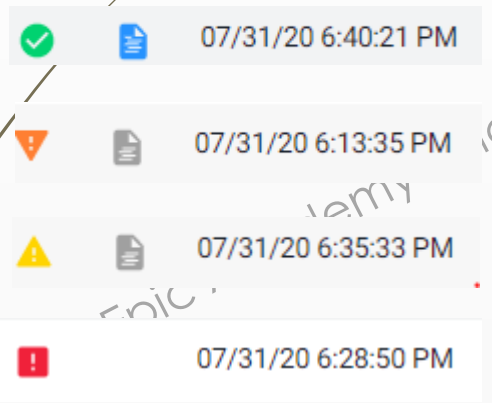


Diagnostic session and Snapshots

After some minutes, you will see a bunch of transaction snapshots,-- Knowledge of this collection will be used in the troubleshooting Module.

1. Full Call Graph – Blue Icon – Manual diagnostic session and periodic snapshots capture full call graph.

2. Partial Graph - Gray Icon – When there is a performance issue, snapshots are collected but most of them can have partial call graph as it will capture from the point where performance issues started.



Green – User Experience Normal

Deep Yellow – User Experience Very Slow

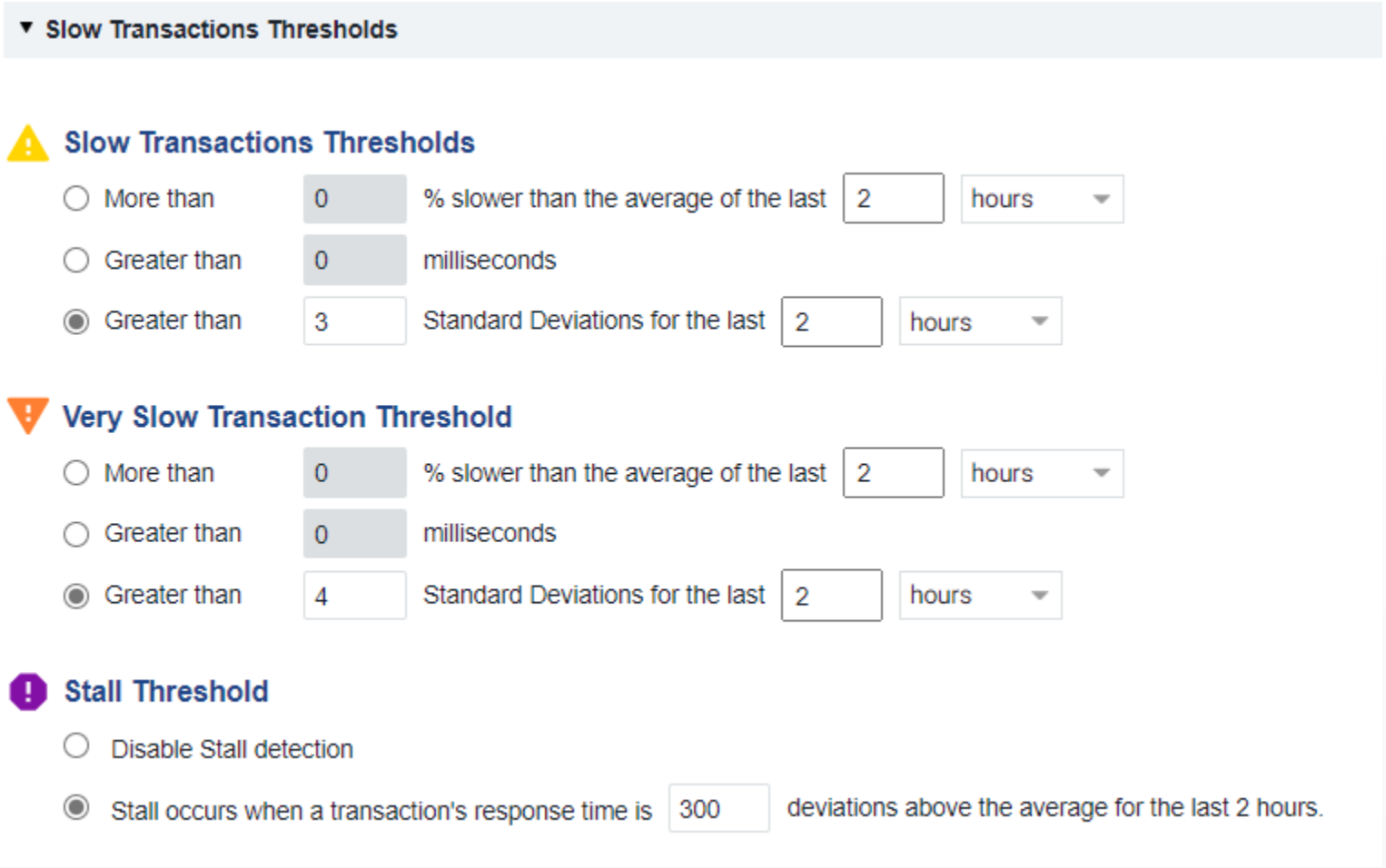
Yellow – User Experience Slow

Red – User Experience Error

Setting up Threshold

Slow transactions trigger diagnostic sessions

AppDynamics is able to determine when to start capturing from the slow transaction threshold below but it can be customized.



Setting up Threshold

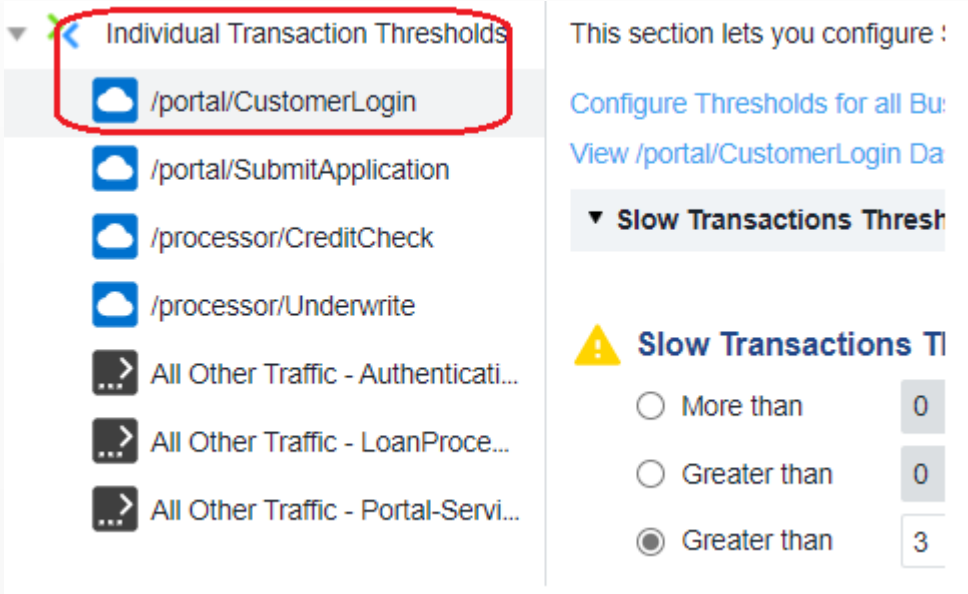
Exercise 9 – Scenario – Adjusting Transaction Threshold

Exercise 9 – Instruction

1. Adjust the very slow transaction so that AppDynamics will flag transactions as very slow when it exceeds 10 seconds.

2. Adjust only the /portal/Customer/Login BT so AppDynamics can flag slow transactions from transaction that are Greater than 2 standard deviation in the last one hour.

Access the individual BTs to answer question 2



The End