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[Course Overview](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live)

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I have](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=13.09) [master's degrees in financial math and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=15.92) [electrical engineering from Stanford](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=18.363333333333333) [University and have previously worked in](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=19.736666666666668) [companies such as Google in Singapore and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=21.752222222222215) [Credit Suisse in New York. I am now](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=24.5675) [co-founder at Loonycorn, a studio for high](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=28.05)[quality video content based in Bangalore,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=30.761428571428574) [India. Cloud Composer is a pipeline](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=33.56750000000001) [orchestration service on the GCP. Based on](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=36.18000000000001) [the Apache Airflow API, Composer was](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=39.21666666666667) [launched in mid-2018 and is fast emerging](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=42.05222222222223) [as a popular and versatile service for](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=44.09) [building and executing system pipelines.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=46.679999999999986) [In this course, you will learn how](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=50.03) [Composer allows cloud users to quickly](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=51.60888888888891) [create pipelines with complex](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=54.02666666666667) [interconnected tasks. First, you will](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=56.050000000000004) [learn where Composer fits into the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=57.94714285714286) [taxonomy of GCP services and how it](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=60.07000000000001) [compares to Dataflow, which is another](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=63.51499999999999) [service for building and executing](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=65.75) [pipelines. You will see how Composer](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=67.62400000000002) [focuses on pipelines of system tasks while](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=69.67999999999999) [Dataflow is all about building data and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=71.7842857142857) [streaming pipelines. Next, you will](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=75.03500000000003)[explore what a Composer environment is and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=77.01666666666668) [how pipelines are specified and run on](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=79.22200000000001) [these environments. The Composer service](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=81.82799999999999) [runs an entire implementation of Apache](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=83.87857142857143) [Airflow, including a Kubernetes cluster](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=85.90714285714286) [and several other infrastructure](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=88.05) [components. Finally, you will understand](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=91.218) [the powerful suite of operators made](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=93.16428571428573) [available for use within Composer](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=95.03500000000003) [pipelines. Pipelines can be thought of as](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=97.39999999999999) [directed acyclic graphs. These graphs can](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=100.74666666666666) [be used to monitor dependencies between](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=103.18625000000002) [steps in the pipeline. Each individual](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=105.43) [step is a task instance equivalent to an](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=107.61000000000001) [instance of an operator. You will use](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=110.35857142857144) [powerful Airflow operators for executing](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=113.55999999999999) [shell scripts, arbitrary Python code,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=115.56) [implementing conditioners, branching, and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=119.02)[complex control flow. When this course is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=121.82600000000001) [complete, you will be very comfortable](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=123.87400000000001) [choosing Composer as the glue in your](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=126.16571428571432) [architecture and will have the skills and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=128.70000000000002) [the knowledge to build and deploy complex pipelines built on the Apache Airflow API.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=85cac371-7126-4f83-821a-2354f13f31c5&clip=0&mode=live&start=130.525)

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This](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=0&mode=live&start=4.543333333333334) [module is all about introducing Composer,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=0&mode=live&start=7.437142857142857) [which is a new and exciting workflow](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=0&mode=live&start=10) [orchestration service on the GCP. Composer](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=0&mode=live&start=11.585) [was launched on July 19, 2018, and it's](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=0&mode=live&start=14.491428571428571) [already becoming one of the most exciting](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=0&mode=live&start=17.8125) [services on the GCP because it adds some](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=0&mode=live&start=20.226000000000003) [genuinely new capabilities. Composer](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=0&mode=live&start=23.347142857142853) [allows us to define a pipeline of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=0&mode=live&start=25.332857142857144) [interconnected tasks in the form of a DAG,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=0&mode=live&start=27.524444444444445) [or a directed acyclic graph. This DAG is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=0&mode=live&start=31) [defined in very simple Python code, which](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=0&mode=live&start=34.076666666666675) [adheres to the Apache Airflow API. Unlike](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=0&mode=live&start=36.65571428571429) [some of the other tools in the Google](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=0&mode=live&start=40.221666666666664) [Cloud Platform such as Dataflow, Composer](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=0&mode=live&start=42.18999999999999) [comes pre-equipped with great](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=0&mode=live&start=44.70333333333333)[visualization support. There's a Composer](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=0&mode=live&start=47.045) [web server, which we can use in order to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=0&mode=live&start=49.06000000000001) [track our jobs, visualize them, and run](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=0&mode=live&start=52.045) [them with an intuitively easy-to-use](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=0&mode=live&start=54.64599999999999) [graphical user interface. Composer runs in](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=0&mode=live&start=57.90142857142858) [something known as a Composer environment.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=0&mode=live&start=61.36666666666666) [This environment runs on Kubernetes. It](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=0&mode=live&start=64.02)[also makes use of various other GCP](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=0&mode=live&start=66.35285714285713) [services such as Cloud SQL, App Engine](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=0&mode=live&start=68.70833333333333) [Flex, and Identity-Aware Proxy in order to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=0&mode=live&start=73.03) [implement the Apache Airflow architecture.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=0&mode=live&start=76.57500000000002) [Over the course of each year, several](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=0&mode=live&start=79.05) [services are added to every major cloud](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=0&mode=live&start=80.52333333333333) [platform. Composer is just one of the new](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=0&mode=live&start=83.62666666666662)[services on the GCP, but there are](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=0&mode=live&start=86.58363636363636) [important reasons why we should pay](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=0&mode=live&start=88.555) [special attention to it. Most notably,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=0&mode=live&start=90.35428571428574) [Composer offers a host of useful](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=0&mode=live&start=92.93555555555555)[operators. It has a BashOperator, a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=0&mode=live&start=95.62222222222219) [PythonOperator, as well as integrations](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=0&mode=live&start=98.57) [with SendGrid to send email, BigQuery to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=0&mode=live&start=100.81666666666666) [perform analytics, as well as with](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=0&mode=live&start=104.51499999999999) [Dataproc, Dataflow, and the Cloud ML](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=0&mode=live&start=106.86999999999998) [Engine. So, Composer really is quite a promising new service.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=0&mode=live&start=109.55500000000002)

[Prerequisites and Course Outline](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live)

[Before we get into the meat of the course,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=0.17) [let's talk prerequisites and quickly](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=2.17) [outline the material coming up ahead.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=4.636666666666666) [Let's start with the prereqs. This](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=7.14) [probably should not be your very first](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=9.448888888888888) [course on the Google Cloud Platform. If](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=11.75111111111111) [you're looking for some basic introductory](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=13.54125) [matter, a couple of courses I could](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=15.768749999999999) [recommend right here on Pluralsight are](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=17.837142857142858) [Choosing and Implementing Google Cloud](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=20.12) [Compute Solutions and Architecting Google](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=22.28428571428571)[Cloud Storage Configurations. Composer](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=25.160000000000004) [actually runs on a Kubernetes cluster and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=27.72857142857143) [makes use of some other pretty nifty GCP](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=31.34125) [technologies such as App Engine Flexible](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=33.73142857142857) [and Identity-Aware Proxy, but these are](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=37.1) [all implementation details of Composer.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=40.238749999999996) [You definitely do not need to know](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=42.12)[anything about these technologies in order](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=44.12) [to use it. Let's turn now to a quick](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=46.14666666666668) [outline of the material coming up ahead.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=48.86571428571429) [We start by introducing Google Composer](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=51.13) [because this is such a new service. It was](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=54.08) [introduced just a few months before this](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=56.70285714285714) [video was recorded. And also, because it](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=58.91)[seems to overlap in many ways with an](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=61.269999999999996) [existing GCP service, that is Google](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=63.9775) [Dataflow, it's important that we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=65.88999999999999) [understand what exactly Composer is and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=67.72) [what it is not. Once we are done with an](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=70.34888888888887) [understanding of what Composer's use cases](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=73.83714285714284) [are, we can turn to some of the mechanics,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=75.78666666666665) [such as creating, configuring, and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=78.27272727272725) [accessing environments. Then we'll move on](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=80.11) [to architecting workflows, managing and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=83.39714285714287) [monitoring these using the tools provided](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=85.67857142857144) [by the platform. And if you're one of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=87.6525) [those brave folks who's been using Google](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=90.39750000000001) [Cloud Dataflow, I have good news for you.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=92.49333333333335) [Managing and monitoring pipelines on](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=95.15) [Composer is a lot easier and a lot more](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=97.59999999999998) [intuitive than doing so on Dataflow. A](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=100.77444444444447) [quick word here about all of the demos in](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=103.35249999999999) [this course. These are all located in a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=105.62499999999997) [hypothetical online retailer called](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=108.65857142857146) [SpikeySales. SpikeySales, as its name](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=111.36000000000001) [would suggest, specializes in flash sales](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=113.43333333333334) [of trending products. These sales are](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=115.82714285714283) [meant to last for only a few minutes at a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=118.105) [time. As a result, SpikeySales.com is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=120.86499999999997) [constantly subjected to spikes in user](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=123.62) [traffic. The nature of the business for](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=126.59500000000003) [SpikeySales has driven it to the cloud. It](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=128.84714285714287) [fits perfectly with the cloud computing](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=131.5325) [model where you pay for the resources that](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=133.7675) [you actually use. These eliminate the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=136.90500000000006) [issues of large, up-front capital](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=139.10500000000002) [expenditures, as well as large idle capacities during the off-sale periods.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=1&mode=live&start=141.45333333333332)

[Composer for Pipeline Orchestration](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live)

[Before we get into a long series of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=0.449) [demo-based examples, let's understand some](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=3.0923333333333334) [of the important conceptual elements of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=4.934000000000001) [Google Cloud Composer. Composer is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=7.454000000000001) [pipeline orchestration technology, so this](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=10.655000000000001) [is the same space as Oozie or Azkaban.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=13.273) [This is a different space than Google](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=16.449)[Cloud Dataflow, which is another](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=19.513444444444453) [complementary service on the GCP, and also](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=21.517749999999996) [a different space from say Spark](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=23.823) [Streaming. We will come back to the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=26.663999999999998) [differences between Composer and Dataflow](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=28.20899999999999) [in more detail. For now, let's just get a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=29.944) [handle on Composer. Using Composer is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=32.782333333333334) [intentionally straightforward. We write](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=35.821) [the code for our pipeline. This must be](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=37.97185714285714) [Python code, it must adhere to the Apache](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=40.60500000000001) [Airflow API, and it's got to be really](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=43.639)[simple code. That's the first step. We](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=45.91900000000002) [then upload our code file into a specific](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=47.89081818181818) [GCS bucket. This bucket is associated with](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=51.50536363636365) [our Composer environment, and as soon as](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=54.91524999999999) [we copy a Python file into this bucket,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=57.74233333333332) [Airflow is going to pick it up. Airflow is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=60.389) [going to parse all Python files in that](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=62.84100000000001)[GCS bucket, and it's going to look for](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=65.56614285714288) [particular keywords. Specifically, it will](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=67.94649999999997) [search for any Python module which](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=69.93274999999998) [instantiates a DAG object in the global](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=72.83344444444444) [namespace. It will then parse that DAG and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=75.94455555555554) [go head and schedule it. When the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=78.57066666666667) [conditions for this pipeline to be](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=80.139) [executed have been met, Airflow will](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=82.12899999999999) [realize that, and it will go ahead and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=84.13344444444445) [parallelize that pipeline and execute it.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=87.02471428571428) [We can keep tabs on that execution using](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=90.419) [the Airflow web server. That's at high](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=92.823) [level how Airflow works. Now let's talk](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=95.30900000000001) [about several important Composer terms.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=98.31399999999998) [The first of these is Airflow, which is a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=101.389) [term we've already used a bunch of times.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=103.21600000000002) [The second of these is Composer, which is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=105.459) [a managed service on the GCP for Airflow.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=108.25900000000001) [Composer runs fully fledged standalone](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=111.459) [deployments. Each deployment is called an](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=114.75899999999999) [environment. Then, environments keep track](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=117.89400000000002) [of DAGs. Each DAG, or directed acyclic](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=119.76899999999999) [graph, contains one pipeline. Each](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=122.9256666666667) [pipeline contains interconnected tasks,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=126.053) [and those tasks are instantiations of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=128.429) [Airflow operators. Finally, those tasks](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=132.14900000000003) [are going to be triggered when certain](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=134.15025) [conditions are met. By putting together](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=136.227) [combinations of different operators and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=138.924) [triggers, we can build some really complex](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=141.035) [pipelines. Let's take these one by one.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=144.00185714285712) [Let's start with the term Airflow. Airflow](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=146.389) [refers to the Apache Airflow API. This is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=148.85328571428573) [currently still being incubated by the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=152.13233333333335) [Apache Software Foundation. Airflow makes](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=154.643) [it really easy for us to write Python code](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=156.805) [to implement DAGs. A DAG is a directed](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=159.46233333333342) [acyclic graph. Airflow will parse these](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=162.60757142857148) [DAGs, schedule them, and ensure that they](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=165.051) [are executed in a manner that all of their](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=167.69150000000002) [dependencies are satisfied. And these](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=171.21100000000007) [dependencies can be expressed using some](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=172.75566666666668) [really simple Python syntax, notably the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=174.78233333333333) [bit shift operators. This leads in nicely](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=178.601) [to the simple Python API that Apache](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=181.72677777777778) [Airflow presents. In contrast to Apache](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=184.42899999999997) [Beam, which is the foundation of Dataflow,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=187.03500000000003) [the Airflow API is a lot simpler, and it's](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=189.479) [a lot more Python focused. This simplicity](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=193.31185714285715) [hides some really scalable underlying](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=196.41566666666668) [architecture, which we'll get to in a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=198.91899999999998) [moment. And, in addition, it's also a very](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=201.12614285714292) [well-thought-through API. It's got a lot](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=203.78900000000002) [of powerful operators for both common and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=206.1432857142857) [uncommon use cases. What's more, we can](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=209.10757142857142) [parametrize the Airflow APIs using Jinja](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=211.26099999999997) [templates. Now we use the term scalable to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=214.77066666666667) [refer to Airflow's architecture, and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=217.065) [that's because under the hood all of the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=219.749) [tasks in our pipelines are going to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=222.30614285714285) [executed on Airflow workers. So this is a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=224.73900000000003)[distributed architecture. The workers are](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=228.43233333333336) [going to go ahead and run all of the tasks](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=230.26757142857147) [on containers. There are several other](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=233.664) [components to Airflow's architecture, most](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=235.26699999999997) [notably a web server, which is going to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=237.829) [provide a really graphical and intuitive](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=240.22899999999996) [way to manage and trigger pipelines. This](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=242.409) [is a big win for Airflow and Composer over](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=244.72471428571427) [Google Dataflow. Also, Airflow has a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=248.209) [scheduler which keeps track of the DAGs.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=250.26099999999997) [It parses them and the ensures that all](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=252.459) [dependencies within them, as well as](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=255.21099999999998) [various trigger conditions are satisfied.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=257.539) [In addition, Airflow makes use of Celery.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=259.439) [This is a task queuing technology which](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=262.419) [allows scalability, and it uses Redis as a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=265.13233333333335) [message broker for Celery. All of these](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=268.8289999999999) [are internal implementation details of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=271.02700000000004) [Airflow, and all of these are implemented](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=273.66650000000004) [by Google Cloud Composer. So that really](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=276.439) [is what Cloud Composer is. It is a GCP](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=280.16525000000007) [managed service for Airflow. It saves us](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=282.96400000000006) [the trouble of creating the workers,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=285.46899999999994) [setting up the web server, the message](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=287.469) [brokers, and all of that. Composer has its](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=290.0261428571428) [own GCP-centric implementation of Airflow.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=293.31774999999993) [The Airflow workers are all executed on a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=296.399) [Google Kubernetes Engine cluster. The](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=299.4456666666667) [metadata associated with Airflow is stored](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=301.841) [on a Cloud SQL instance. The Airflow web](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=304.2975714285714) [server runs as an App Engine Flex](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=307.607) [application, which is protected using an](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=310.09066666666655) [Identity-Aware Proxy. And finally, in](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=313.2575714285715) [order to submit a pipeline to be scheduled](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=315.16525000000007) [and run on Composer, all that we need to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=317.7275714285714) [do is to copy our Python code into a GCS](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=320.5190000000001)[bucket. So, every Composer environment is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=324.0304285714286) [going to have its own GCS bucket. Within](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=326.82025) [that, it'll have a folder called DAGs. Any](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=329.794) [Python code uploaded into that folder is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=332.71042857142857) [automatically going to be picked up and processed by Composer.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=2&mode=live&start=334.74614285714284)

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[In its short life so far, Composer has](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=0.245) [probably encountered this question more](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=3.22) [than any other: How is Composer different](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=5.22) [from Dataflow? So let's go ahead and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=7.5649999999999995) [answer that question. Dataflow focuses](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=10.097500000000002) [heavily on big data processing with](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=12.346428571428572) [special emphasis on windowing and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=15.609285714285715) [streaming. Composer focuses on general](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=17.780714285714286) [purpose applications such as scripting and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=20.195000000000004) [generic Python. Dataflow pipelines are](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=23.204999999999995) [usually agreed to be pretty complex to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=26.003) [implement and get right. Composer](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=28.867222222222217) [pipelines are very simple to implement and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=30.602999999999998) [often just work. Dataflow pipelines are](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=33.699999999999996) [also quite cumbersome to trigger. We need](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=36.697500000000005) [to pick the right kind of runner. That](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=39.63611111111112) [could be a Dataflow runner or a local](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=41.517) [runner. We've got to specify a large](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=43.933)[number of input arguments and make sure](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=46.61699999999999) [that our job submission happens just](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=49.402) [right. Lots of users have problems where](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=51.79600000000001) [they get a Dataflow pipeline working fine](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=54.50388888888889) [locally, and then it mysteriously doesn't](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=56.87611111111111) [work when deployed to a Dataflow runner.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=58.61125) [Virtually, none of these issues are](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=61.245)[experienced with Composer. We just copy](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=62.972500000000004) [our Airflow Python file into the DAGs](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=66.295) [folder, and Composer takes over from](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=68.815) [there. Another common complaint which](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=70.90833333333332) [Dataflow users tend to have is how](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=73.42999999999999) [nonintuitive the UI is. There is indeed a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=76.18) [visualization UI in Dataflow, but that's](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=79.21000000000002) [not central. We can't use it to trigger](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=81.215) [jobs, for instance. Composer, on the other](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=83.54833333333333) [hand, is fundamentally UI-based. There is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=85.05099999999997) [a nice Airflow web server hosted as an App](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=88.73928571428571) [Engine Flex application, and this is the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=91.35785714285713) [standard way for monitoring and triggering](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=93.53833333333336) [our pipelines. Dataflow's operators are](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=95.54500000000002) [notoriously hard to use. They are similar](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=98.34214285714287) [enough to Spark operators to be confusing,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=101.92999999999999) [but often only partially implemented in](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=104.225) [Python. Composer, on the other hand, is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=106.81357142857141)[Python-centric and has many helpful](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=109.7907142857143) [specialized operators, as we will discover](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=112.1816666666667) [in the examples coming up ahead. These](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=114.37299999999999) [were the differences between Dataflow and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=116.4375) [Composer from a user's perspective. Let's](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=118.33874999999998) [now go ahead and talk about some of the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=120.52357142857143) [architectural differences. Dataflow is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=123.42499999999998)[serverless, so no clusters are explicitly](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=125.55166666666668) [provisioned, and the back-end VM instances](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=127.89666666666669) [are brought up and taken down entirely by](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=130.245) [the service. This is completely](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=132.6529999999999) [transparent to us. Composer, on the other](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=134.73000000000002) [hand, runs its environments on Kubernetes](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=137.04500000000004) [clusters, and, in addition, there are also](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=140.51333333333335) [various other GCP components hosted within](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=142.09928571428568) [an environment. As end users, we have no](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=145.7621428571429) [access to the compute nodes in Dataflow,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=148.0907142857143) [but we do indeed have access to the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=150.255) [compute nodes in our GKE cluster, just as](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=152.9375) [we would with any other GKE cluster. Also,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=155.83166666666668) [we can scale up an environment on the fly](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=158.45499999999998) [by increasing the size of the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=161.04785714285714) [corresponding cluster. Dataflow implements](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=163.18) [the Apache Beam API, while Composer](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=164.865) [implements the Apache Airflow API. As](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=167.365) [we've already discussed a few times, Beam](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=170.45214285714286) [combines batch and streaming](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=172.68) [architectures. It's meant to support both](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=174.7) [Python and Java, and, in fact, sometimes](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=177.06125000000003) [the Python support for Beam can seem a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=179.53500000000003) [little patchy. Airflow, on the other hand,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=181.76928571428567) [is purely Python-based in terms of its](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=184.165) [user APIs. For all of these differences,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=187.2994444444445) [there are many similarities in the way in](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=189.245) [which these services are used. With](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=191.57388888888886) [Dataflow, we first write the code for our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=193.62900000000002)[pipeline. We then go ahead and submit our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=196.78100000000006) [job for execution. The service takes over,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=199.97500000000005) [it goes ahead and assigns workers which](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=202.235) [are going to parse the job and execute it,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=204.525) [and finally, that pipeline is going to be](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=207.225) [parallelized. The orchestration of those](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=209.91833333333338) [tasks is carried out by the Dataflow](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=211.85500000000002) [service. Virtually, each one of these](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=214.79214285714284) [steps occurs also with Composer. We start](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=217.03) [by writing the code for our pipeline. This](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=218.91722222222222) [is our simple Python code. We then go](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=221.72500000000002) [ahead and copy it into a GCS bucket. That](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=225.00409090909093) [makes Airflow aware of it. Airflow picks](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=227.70666666666668) [up that code, parses it, and schedules it](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=230.593) [for execution, and it also orchestrates](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=233.39214285714286) [the execution of the individual task](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=236.2016666666667) [instances on worker nodes. So clearly,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=238.695) [there are many conceptual similarities](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=241.07214285714284) [between Composer and Dataflow for all their many differences.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=3&mode=live&start=243.215)

[Apache Airflow](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live)

[Now that we've understood how Airflow is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=0) [implemented by Composer on the GCP, let's](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=2.7006666666666668) [go ahead and understand the idea of an](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=5.562) [environment. An environment is basically](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=8.738000000000001) [one self-contained deployment of the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=10.394) [Airflow architecture. This is implemented](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=13.864) [by Composer as a Google-managed tenant](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=16.541999999999998) [project, which is going to be hosted](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=19.738) [entirely within a region. So within an](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=22.728000000000005) [environment, we are going to have one copy](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=25.104) [of all of the resources within Composer.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=27.334) [This includes a GKE cluster, a Cloud SQL](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=30.384) [instance for the metadata, and App Engine](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=33.63971428571428) [Flexible application for the Airflow web](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=36.538000000000004) [server. The whole purpose of an](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=38.994000000000014) [environment is to execute DAGs, so let's](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=41.66233333333334) [turn to those next. DAG is an acronym for](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=44.034) [directed acyclic graph. This is defined in](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=47.23899999999999) [a Python Airflow script. This Python](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=50.389) [Airflow script is basically just a DAG](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=53.354) [definition file, so there should not be](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=56.45971428571427) [any other complex processing within this](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=58.06399999999999) [Python, and it should execute pretty much](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=60.74) [instantaneously. As users of Airflow or of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=63.93114285714287) [Composer, this is the file we care most](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=66.89257142857139) [about. It's going to contain the DAG](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=69.09024999999997) [definition, which in turn contains all of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=71.0925714285714) [the operators and their dependencies. The](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=73.52114285714286) [Airflow Python script is very simple, but](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=76.65257142857143) [please do not lose sight of the underlying](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=78.71066666666667) [complexity. The different tasks which we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=81.8365) [instantiate and use within a DAG are all](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=84.0256666666667) [going to be executed on different workers,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=87.00955555555555) [and that is going to be orchestrated by](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=89.374) [Airflow. Our DAG object must be defined in](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=92.0228888888889) [the global namespace. And the usual way of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=95.13999999999997) [using the DAG is via a context manager,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=97.60274999999999) [also known as a with clause in Python. So](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=100.364) [within this with clause, we go ahead and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=103.78999999999999) [define our operators and the dependencies](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=106.48257142857142) [between them. We then copy over our DAG](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=108.54400000000001) [file into the environment's GCS bucket,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=111.05828571428574) [and from there, it's going to be picked up](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=114.314) [by Airflow, parsed, and then scheduled for](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=116.76854545454539) [execution. Notice again how much easier to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=119.87233333333334) [use this is than Dataflow. We do not have](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=122.55490909090908) [to explicitly configure all of the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=125.52400000000003) [command-line arguments or the runner. We](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=127.51525000000001) [don't need to submit a gcloud submit jobs](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=129.878)[command. Within the body of our DAG, we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=133.82999999999998) [have individual operators. Each step of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=135.8965) [our pipeline corresponds to the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=138.86400000000003) [instantiation of one operator, and that](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=141.32066666666668) [instantiation is called a task instance.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=144.07649999999998) [So each task instance exists inside the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=146.364) [pipeline and is usually defined within the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=149.0065) [Python context manager or with clause for](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=152.004) [the corresponding DAG. Really, the power](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=154.50257142857143) [and beauty of Composer and of Airflow lies](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=156.65399999999997) [in its operators. Here is a list of the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=159.5168571428572) [operators which we will be using in this](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=162.09257142857138) [course. And this is far from an exhaustive](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=164.94650000000004) [list. So you can see that we have](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=167.14274999999992) [BashOperators, generic PythonOperators,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=169.98525000000004) [and many more. The BashOperator is in some](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=171.554) [ways the most intuitive. This allows us to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=175.03177777777773) [specify Bash commands. These are scripts](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=178.07685714285716) [which are going to be executed on some](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=180.34066666666666) [worker in the Airflow cluster. That worker](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=183.194) [is effectively going to be making use of a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=186.04955555555557) [Debian-based Docker container. That](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=189.156) [container will already have several](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=190.70733333333334) [packages preinstalled corresponding to the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=192.374) [various GCP commands-line utilities such](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=195.36733333333333) [as gcloud, bq, gsutil, and kubectl.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=198.04542857142857) [BashOperators are great. They're really](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=202.314) [practical because there's still so much](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=204.03066666666666) [that can be done using shell scripts. Next](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=205.49066666666664) [is the PythonOperator. This allows us to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=208.85399999999998) [specify arbitrary Python code in a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=212.33733333333336) [container. That container already includes](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=214.92200000000005) [references to many common GCP client](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=216.97200000000004) [libraries. To make use of such an](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=220.70066666666662) [operator, all we do is parse in an](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=223.07828571428567) [arbitrary Python function. That function](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=226.13600000000008) [is going to be called by the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=227.63257142857145) [PythonOperator and executed on the worker](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=229.69733333333335) [node. Neither of these operators have any](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=232.06066666666666) [platform lock-in. In addition, there are](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=235.329) [also GCP operators. These are going to be](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=237.50114285714284) [automatically configured by Cloud](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=240.03400000000005) [Composer, and these include a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=241.8715) [BigQueryOperator, as well as connectors](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=244.74200000000005) [for Google Cloud Storage, Cloud Dataflow, Cloud Dataproc, and Cloud ML Engine.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=4&mode=live&start=246.829)

[Google Composer and Apache Airflow](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live)

[Another interesting operator we'll be](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=1.332) [using in this course is the EmailOperator.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=2.722) [This can be used to send emails from](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=5.402) [within our DAG, and it works on the basis](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=8.267454545454546) [of an integration between Airflow and a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=10.702) [third-party email platform called](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=13.757999999999997) [SendGrid. Another interesting operator we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=15.852) [will implement is the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=17.887) [BranchPythonOperator. This is also a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=19.906999999999996) [Python-based operator which takes in a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=22.372000000000007) [Python function. However, unlike the plain](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=24.698666666666664) [PythonOperator, this one dynamically](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=27.756) [determines which task to execute next, and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=29.881999999999998) [that is because the Python function we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=33.632) [parse into this must return the task ID of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=35.70311111111111) [the next task to be invoked. Branching](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=38.63914285714286) [requires the use of something known as the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=40.70033333333333) [DummyOperator. Consider a DAG where we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=43.899499999999996) [have one operator called run\_this\_first.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=46.2395) [This one branches out, so this has a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=49.362) [branch PythonOperator up next, following](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=51.73866666666666) [which there are two possible paths for](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=53.662000000000006) [code execution, branch\_a and a dummy task.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=57.135999999999996) [The dummy task can be thought of as a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=61.322) [missing else condition. Branch\_a is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=63.902) [followed by additional tasks, but then](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=66.362) [both of these paths converge in a task](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=69.22200000000001) [called the join task. In order to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=72.65771428571429) [implement this logic correctly, the dummy](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=75.2462857142857) [task must be present for the else](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=77.21000000000001) [condition. If you were to omit the dummy](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=80.00300000000001) [task, the join task would be skipped. So](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=82.152) [this really gets at the heart of why](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=85.49485714285714) [DummyOperators exist in Airflow at all. We](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=87.40450000000001) [should never leave an empty path after a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=90.783) [branch. Instead, we've got to use a dummy](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=93.99099999999997) [task. Let's understand what precisely it](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=97.83075000000005) [means to leave a path empty. On screen](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=100.33866666666667) [right now is the right way to do](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=103.092) [branching. You can see that in the top](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=105.972) [part of the branch we have two tasks,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=108.26654545454548) [branch\_a and follow\_branch\_a, and in the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=110.382) [bottom we have a dummy task. This is the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=113.39866666666668) [right way because remember that the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=116.58)[branching operator is going to compute](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=119.34533333333334) [internally the task ID of the next task.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=121.827) [That works out to be either branch\_a or](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=124.372) [dummy task. And in either case, the join](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=127.54800000000004) [task over at the extreme right is going to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=130.1395) [be implemented. Now let's take a look at](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=134.14000000000001) [how this could be done wrong. Let's say we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=136.84199999999998) [had omitted the dummy task from the path](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=138.976) [below. The branching operator will try and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=141.9377142857142) [compute the task ID of the following task,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=143.83866666666665) [and that would either be branch\_a or join.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=147.332) [Let's say that the upper path of the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=151.322) [branch was executed, then the task I'd, it](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=153.5256363636364) [would be branch\_a, and the join operation](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=156.24575) [would then be entirely skipped. This is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=159.58200000000005) [why DummyOperators are required in](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=163.0895) [Airflow. We need them in order to create](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=164.98324999999997) [the empty path coming out of a branch. The](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=167.352) [last important concept that we need to be](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=170.6462857142857) [familiar with is that of a trigger.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=173.01644444444443) [Remember that the Airflow scheduler is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=175.342) [monitoring all of the DAGs, as well as the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=177.1162857142858) [individual task instances. A trigger is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=180.28472727272717) [how the Airflow scheduler knows that a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=182.4795) [particular task instance can now be](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=185.134)[executed. This happens when all of its](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=187.85949999999997) [dependency conditions have been met. A](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=190.0777142857143) [quick word that the exact execution time](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=192.72575) [of a task is not deterministic. The](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=195.342) [Airflow scheduler is going to monitor](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=197.7845) [DAGs. It keeps track of properties called](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=200.01950000000002) [the schedule\_interval and the start date,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=202.402) [and it's going to put a DAG up for](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=205.342) [execution after one schedule\_interval has](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=208.0959999999999) [elapsed after the start date. After that,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=210.71033333333335) [the latency might vary based on the system](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=213.06866666666667) [load and other conditions. Individual task](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=215.892) [instances all include their own trigger](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=218.562) [conditions. There are several possible](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=221.8245) [trigger rules. The default of these is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=223.68200000000002) [all\_success. So if you do not include a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=226.84533333333334) [trigger rule in an operator, it will only](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=228.91311111111102) [be executed when all of its upstream](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=231.556) [nodes' task instances have been executed](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=234.25074999999995) [successfully. There are also other various](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=237.6295) [trigger rules which will be invoked if all](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=239.81485714285716) [of its parents have failed, or if at least](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=241.96628571428573) [one has failed, at least one has](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=244.5448571428571) [succeeded. A dummy trigger rule is going to trigger without checking any condition.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=5&mode=live&start=247.75399999999996)

[Enable APIs and Create Composer Environment](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live)

[Let's get started with our first demo in](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=0.057) [which we enable all of the necessary APIs](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=3.305888888888889) [and create our first environment. We start](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=6.017) [from the Google Cloud Console. That's](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=9.891285714285713) [console.cloud .google .com. Note that we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=12.7295) [are in an incognito window. That's usually](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=16.112) [the best way to get started. So we signed](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=18.502) [in using our username and password, and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=21.36366666666667) [when we are done, we are taken to the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=24.197) [Google Cloud Console. We can see the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=26.859499999999993) [project that we are working in over up](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=28.90623076923077) [top. Here it's called spikey-gcp. We can](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=30.76469230769231) [also see the project name, project I'd,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=34.56557142857143) [and project number in the Project info](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=36.799) [card over in the top left. In the top-left](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=39.596999999999994) [corner are three horizontal lines. These](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=42.7395) [are called the Navigation menu, sometimes](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=45.312) [also referred to as the hamburger. These](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=47.414142857142856) [are the easiest way to navigate the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=50.26128571428571) [various services on the GCP. The first](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=52.31033333333333) [thing we need to do is to enable the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=54.639307692307696) [required APIs. So, in the Navigation menu,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=57.394692307692324) [we browse to APIs & Services and click on](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=59.967) [Library. In a search bar which appears, we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=62.519499999999994) [type out Cloud Composer API, and this](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=65.31533333333333) [gives us just the one result. Let's click](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=67.557) [on it and then click on the big blue](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=69.62842857142859) [ENABLE button. The Cloud Composer API is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=73.01699999999998) [now enabled. Now, by default, Cloud](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=76.1684285714286)[Composer environments run as the Compute](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=79.23949999999999) [Engine default service account, and so we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=81.7412857142857) [will need to add some additional rules to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=84.65699999999998) [that default service account. In order to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=86.68033333333334) [do so, let's navigate into the IAM & admin](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=88.89985714285714) [section and click on IAM. I-A-M, or IAM,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=93.32033333333334) [is an acronym for Identity and Access](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=96.03200000000001) [Management. There we get a list of all of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=99.429) [the service accounts including the default](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=102.20154545454541) [Compute Engine service account. This](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=104.71414285714287) [currently has two rules mapped to it. One](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=107.2345) [of these is Cloud Trace Agent. That's](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=109.45557142857143) [because I was previously using some](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=112.14699999999999) [machines in this cluster for Stackdriver](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=113.5395)[Trace. And the other is project Editor. We](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=116.49450000000004) [will have to add some additional rules](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=119.38144444444444) [here. So let's click on the little pencil](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=121.72255555555554) [icon over on the far right. There, we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=124.60324999999997) [click on the ADD ANOTHER ROLE option.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=127.64811111111112) [Here, we find all of the roles associated](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=129.997) [with Cloud Composer. At a very minimum, we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=132.4895) [need to give this service account the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=135.30842857142855) [Composer Worker role, but we are actually](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=137.49200000000002) [going to go with something a lot more](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=139.785) [powerful. This is the Environment and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=141.77199999999996) [Storage Object Administrator. This role](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=145.12075000000002) [has even more capabilities than the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=147.64700000000002) [Composer Administrator role because it](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=149.799) [allows us to work with the underlying](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=151.66699999999997) [Cloud Storage buckets. We hit SAVE and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=154.002) [confirm that our service account does](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=156.36144444444446) [indeed have the right role, and we are now](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=158.347) [ready to open up the Composer section of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=161.08790909090914) [the Navigation menu. We could choose to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=163.48950000000002) [use that little pin icon in order to pin](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=165.86922222222225) [it to the top of our Navigation menu. In](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=168.017) [any case, we are now taken into the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=170.4142727272727) [Composer dashboard. At this point, we have](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=173.27245454545442) [no environments in existence in our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=175.42271428571433) [project. We can, however, change that by](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=177.59700000000004) [clicking on the CREATE environment button](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=179.7027142857143) [up top. When we do so, we have prompted](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=182.1584285714286) [first for an environment name. Let's go](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=184.7595) [with spikey-test-environment. Next comes](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=188.002) [the node configuration. As we've already](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=190.213) [discussed, these environments in Composer](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=192.772) [are going to run on Google Kubernetes](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=195.037) [Engine clusters, and this is where we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=198.117) [configure the GKE cluster. We first](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=201.20811111111115) [specify the number of nodes which are](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=203.55128571428574)[going to run the Airflow software, that's](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=205.492) [three by default, and we accept that.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=207.2645) [These nodes are VM instances, and they](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=209.967) [require us to specify the region and zone](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=211.833) [for those VM instances, so the region that](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=214.977) [we go with is us-central1. We also need to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=217.80255555555559) [specify the zone, for which we pick](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=221.13985714285712) [us-central1-a. There are also advanced](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=224.373) [configuration options down below, which we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=226.492) [could specify if we'd like. These have to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=228.86271428571428) [do with the OAuth scopes, which are going](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=231.72325) [to be available to the node VMs, as well](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=233.58499999999998) [as the VPC on which these node VMs are](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=235.80700000000002) [going to exist. If we leave these blank,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=238.9703333333333)[they will simply run on the default VPC.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=240.997) [If we scroll down a little, there's an](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=243.037) [important setting there. That's the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=245.215) [version of Python which we want to run.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=247.379) [Let's go with Python version 3. Down](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=249.027) [below, we can see a section for the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=252.12985714285713) [Airflow configuration overrides. As the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=254.61499999999998) [tooltip informs us, this is a way for us](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=257.395) [to override the default configuration](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=259.537) [values which are present in a file called](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=261.522) [airflow.cfg. These configuration options](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=265.50824999999986) [apply to a host of services available on](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=267.4845) [Airflow, which include the command-line](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=270.63699999999994) [interface, the web server, email, SMTP,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=273.4170000000001) [Hive, GitHub, scheduler, and so on. There](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=276.967) [is also a section where we can specify](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=280.189) [additional environment variables which are](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=282.7112857142858) [going to be parsed into the Airflow](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=284.60499999999996) [scheduler. Finally, there are labels.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=286.7329999999998) [These are key-value pairs which we can](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=288.997) [associate with any GCP resource. We are](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=291.147) [now ready to go ahead a hit CREATE. This](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=293.635) [is going to provision our first](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=296.195) [environment, the spikey-test-environment. Let's click through into it.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=6&mode=live&start=298.3336666666667)

[Examine a Composer Environment](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live)

[This allows us to view various properties,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=0.616) [starting with the ENVIRONMENT](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=3.606) [CONFIGURATION. In here, we can view all of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=6.022) [the values we just specified, the zone,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=8.381833333333333) [the service account, the GKE cluster ID,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=10.520444444444443) [and down below the DAGs folder, a URL for](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=13.616) [the Airflow web UI, and a link to view the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=17.487428571428566)[logs. These last three are going to be](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=21.19600000000001) [quite important. We make a note of the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=23.933777777777767) [DAGs folder. This is because it also](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=26.125999999999994) [contains the name and location of the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=28.26933333333334) [Google Cloud Storage bucket where we need](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=30.426) [to copy in our DAGs. There are also tabs](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=33.13475000000001) [for the other sections, such as the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=36.611000000000004) [AIRFLOW CONFIGURATION OVERRIDES; the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=38.63100000000001) [ENVIRONMENT VARIABLES; the LABELS, that's](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=40.31933333333333) [the key-value pairs associated with the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=42.64600000000001) [GCP resources; and finally, additional](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=44.85799999999999) [PYPI PACKAGES. These are the required](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=48.017999999999994) [libraries which our DAGs are going to use.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=50.45800000000001) [We will use all of these sections in the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=53.596) [demos up ahead. Let's switch now to the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=56.59600000000002) [Kubernetes Engine section of the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=59.05314285714287) [Navigation menu and click on Clusters. A](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=60.806000000000004) [quick word here. Remember that Airflow and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=63.900285714285715) [Composer are being offered by the GCP as](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=66.03975) [something of an alternative to Google](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=69.14975000000001) [Dataflow. And one of the grouses, one of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=72.11225000000005) [the complaints that many users have had](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=74.20457142857143) [with Dataflow is that it's very hard to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=76.29711111111112) [figure out where the underlying compute is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=78.98266666666667) [running. Composer definitely addresses](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=81.33933333333339) [that criticism. So it's not serverless. We](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=83.47) [can click through into the actual](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=86.936) [Kubernetes cluster. Here we can see all of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=88.97600000000003) [the information for this cluster like any](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=91.14100000000002) [other cluster. Let's drill down one level](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=93.75742857142858) [further in the Navigation menu. We go to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=96.13100000000003) [Compute Engine and click on VM Instances.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=98.85300000000001) [And that, in turn, allows us to view each](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=101.646) [of the individual nodes in that cluster.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=104.0085) [There are three nodes here, each of them](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=106.616) [in us-central1-a. Finally, let's also open](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=109.46) [up the Storage section of the Navigation](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=112.15100000000001) [menu and click on the Browser tab there](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=114.73145454545454) [because we would like to explore the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=117.626) [underlying Google Cloud Storage bucket,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=119.16266666666667) [which has the state and other information](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=121.646) [for our Composer environment. Recall that](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=123.666) [we had noted down the DAGs folder, which](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=127.30488888888888) [was a GCS storage location, from the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=129.98433333333332) [environment section a moment ago. This](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=132.51600000000002) [helps us identify the GCS bucket](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=135.04028571428572) [associated with our Composer environment.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=137.586) [We click into this folder and find a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=140.586) [number of important files and folders.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=142.62266666666665) [There is the airflow.cfg, which contains](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=144.636) [all of the configuration information. Down](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=148.4602857142857) [below is the dags folder into which we are](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=151.141) [going to copy the Python code for our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=154.19885714285718) [pipelines. And there's an env\_var.json](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=157.12766666666667) [file. Notice how the environment variables](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=160.80999999999997) [and the configuration properties of our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=163.596) [Airflow services are different from each](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=165.56044444444444) [other. And if we scroll down, we can also](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=168.2137777777778) [see two folders for logs and plugins,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=170.63599999999997) [respectively. Let's explore the content of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=174.04800000000003) [some of these files by activating Cloud](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=176.94266666666667) [Shell. This is something that we do by](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=179.29933333333338) [clicking on the little icon over on the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=181.35975000000002) [top right. In case you're not familiar](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=183.9548888888888)[with Cloud Shell, this is effectively a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=185.88225) [browser-based terminal window. This is a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=188.90457142857147) [session on some VM on the Google Cloud](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=191.47171428571428) [Platform. It's an ephemeral VM, so we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=193.44999999999996) [should not count on having its state](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=196.19600000000003) [preserved. This window has all of the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=198.33100000000007) [Google SDKs and client libraries](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=200.16599999999997) [installed, so we can use it to run pretty](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=202.1535) [much any command-line operations. By](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=204.40599999999998) [default, the Cloud Shell window opens up](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=207.791) [in the same browser tab. We click on the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=209.23457142857143)[Open in new window button to expand it](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=211.88984615384612) [out. And once we get to the command line,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=214.35753846153835) [we start by exporting an environment](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=217.596) [variable, which is going to just make our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=220.15885714285713) [prompt a lot shorter. This is so that we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=222.5205454545455) [have more screen real estate area for our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=224.3474285714285) [commands. This step is completely](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=227.19028571428575)[optional. Then we clear our terminal](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=229.24799999999996) [window and run our first command. We make](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=231.33100000000005) [use of the gsutil cat command to view the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=234.64600000000002) [contents of our airflow.cfg file. Gsutil](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=238.74099999999999) [is the standard command-line utility for](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=241.25) [working with GCS buckets. And we can see](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=244.59266666666667) [here that the configuration parameters are](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=247.52599999999995) [grouped into sections, starting with the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=249.166) [core section. Notice the dags\_folder which](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=252.406) [we will have to work with directly. Moving](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=254.996) [on, there are separate sections for the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=257.85422222222223) [webserver and other services like email, celery, smtp, scheduler, and kubernetes.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=7&mode=live&start=259.7317777777778)

[Pricing](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live)

[In this video, we will discuss the pricing](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=0.853) [for the Google Cloud Composer service. The](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=2.883) [pricing is based on the size of our Cloud](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=6.131571428571428) [Composer environment, and this includes](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=9.093) [fees, which are calculated on a per-minute](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=11.3905) [billing basis. The important bit here is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=14.163000000000004) [that these charges are in addition to the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=16.747999999999998) [standard charges for Kubernetes Engine and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=19.307285714285722) [for Cloud Storage. Let's quickly sample](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=22.16728571428571) [what some of these charges might work out](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=24.63425) [to be. This is an indicative list of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=26.520999999999997) [prices for the us-central1 region. This](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=29.45300000000001) [information is current as of November](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=33.231750000000005) [2018. However, the pricing of cloud-based](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=35.504249999999985)[services often changes very quickly, so](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=37.57466666666666) [you ought to check back into the URL on](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=40.060272727272725) [screen for the latest numbers. Let's now](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=41.74572727272727) [talk about the various items for which we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=44.477285714285706) [are charged. Notice that we are charged](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=47.071000000000005) [separately for the number of hours that we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=48.726333333333315) [use for our web core, that's for the App](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=51.463)[Engine Flex running the web server, the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=54.117000000000004) [database core, the service associated with](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=56.409666666666666) [both of these, as well as the network](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=59.245000000000005) [egress. We should know that every](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=62.46100000000001) [environment also comes with a long list of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=64.373) [internal resources. So there's a great](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=67.313) [deal of storage associated with an](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=68.731) [environment. There are vCPUs which](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=71.41633333333336) [correspond to the database, the web](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=73.413) [server, as well as the worker nodes in our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=75.5641111111111) [GKE cluster. Also note that some, but not](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=78.843) [all, of these properties are adjustable.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=81.57442857142858) [As it turns out, all of the properties](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=83.923) [associated with the GKE cluster used for](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=85.923) [compute are adjustable. These include the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=89.109) [worker machine type, the number of worker](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=91.87299999999999) [nodes, and the storage per worker. We](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=93.72100000000002) [cannot change any of the settings](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=97.13871428571429) [associated with the Cloud SQL instance or](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=98.853) [with the App Engine Flex application. The](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=101.343) [docs also give us a real specific](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=104.361) [scenario. Let's say that we created a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=107.41050000000001) [Cloud Composer environment, and we did not](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=109.84299999999998) [change any of the defaults. Based on our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=112.1896666666667) [usage, let's say we used this 25% of the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=114.6455) [time and had 6.5 GB of egress. The cost at](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=117.57855555555555) [current rates as of November 2018 would](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=121.89966666666668) [work out to around $76 for the month.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=124.35077777777778) [Please remember that this is entirely over](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=127.853) [and above the cost of the GKE cluster. So](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=129.46299999999994) [if we were using our GKE cluster for](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=133.12675) [compute jobs for 25% of the month, that](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=135.27925) [would be a pretty significant cost as](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=138.46744444444445) [well. That gets us to the end of this](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=142.34855555555555) [module in which we introduced Google Cloud](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=144.65411111111118) [Composer, which is a relatively new and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=147.42728571428574) [attractive workflow orchestration service](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=150.3455) [on the GCP. In Composer, we can write a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=152.35549999999998) [simple Python code which adheres to the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=155.86966666666666) [Apache Airflow API. Apache Airflow is a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=158.6044285714285) [project which is still under incubation at](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=161.46300000000005) [the Apache Software Foundation, but it](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=164.267) [provides a great way to define pipelines.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=166.7652222222222) [Each pipeline consists of a directed](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=169.853) [acyclic graph of interconnected tasks.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=172.13299999999998) [This pipeline can be easily visualized](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=174.893) [managed using the Apache Airflow web](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=177.843)[server. A GCP project can have multiple](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=180.44871428571432) [environments where each environment is a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=183.43728571428576) [self-contained Apache Airflow deployment.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=185.54633333333337) [Each environment runs on Kubernetes and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=187.893) [makes use of additional GCP services, such](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=190.32299999999998) [as Cloud SQL to store the environment](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=193.28744444444445) [metadata, and then App Engine Flex web](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=196.39855555555565) [server. The primary appeal of both Cloud](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=198.63442857142851) [Composer and Apache Airflow is the large](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=201.47014285714283) [number of useful operators made available.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=204.44728571428575) [We've already worked with some of these.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=207.893) [We will now go ahead and explore many more.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=9e5723d4-bb32-45c1-b3f6-3ba47d5fa5c7&clip=8&mode=live&start=209.873)

[Creating, Configuring, and Accessing Environments](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=0&mode=live)

[Module Overview](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=0&mode=live)

[Hello, and welcome to this module about](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=0&mode=live&start=0) [creating, configuring, and accessing](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=0&mode=live&start=2.70375) [environments. This module is packed with](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=0&mode=live&start=5.325) [demos and examples. We start by seeing how](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=0&mode=live&start=8.469999999999999) [we can define DAGs. A DAG is a directed](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=0&mode=live&start=12.255555555555555) [acyclic graph which defines an](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=0&mode=live&start=15.46285714285714) [interconnected set of task instances. We](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=0&mode=live&start=17.183750000000003) [will also see how we can configure](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=0&mode=live&start=19.365714285714287) [different trigger rules. These are](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=0&mode=live&start=21.5275) [conditions which are checked by the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=0&mode=live&start=23.834) [Airflow scheduler before deciding whether](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=0&mode=live&start=25.89714285714286) [to run a task instance or not. We will](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=0&mode=live&start=27.45375) [then break into a series of examples to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=0&mode=live&start=30.621428571428574) [demonstrate the use of some of the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=0&mode=live&start=32.544999999999995) [fundamental building blocks available in](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=0&mode=live&start=34.75857142857143)[Apache Airflow. These are the important](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=0&mode=live&start=37.01) [operators. There is a BashOperator. This](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=0&mode=live&start=39.642) [can be used to specify a shell script,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=0&mode=live&start=42.37) [which will be executed by the environment](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=0&mode=live&start=45.01) [in a remote machine which is running a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=0&mode=live&start=47.07) [Debian Docker image. Next, we discuss a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=0&mode=live&start=50.67000000000002) [PythonOperator, which can be used to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=0&mode=live&start=53.65200000000001)[implement arbitrary Python callbacks. It's](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=0&mode=live&start=55.709999999999994) [also possible to implement conditionals,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=0&mode=live&start=59.36) [or branches, within our DAGs. We do so](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=0&mode=live&start=61.06) [making use of the BranchPythonOperator.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=0&mode=live&start=63.74444444444447) [This one also takes in Python callbacks.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=0&mode=live&start=67.02) [The callback here returns the task ID of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=0&mode=live&start=69.05) [the next task to be executed. Along the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=0&mode=live&start=72.47142857142858)[way, we also need to make use of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=0&mode=live&start=75.44666666666666) [DummyOperators to properly architect](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=0&mode=live&start=77.61) [branching within our DAG. So](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=0&mode=live&start=80.01) [DummyOperators need to be used along with](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=0&mode=live&start=82.38666666666666) [BranchPythonOperators. As the name would](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=0&mode=live&start=86.04333333333332) [suggest, a DummyOperator is one which does](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=0&mode=live&start=88.17857142857142) [nothing. Let's now plunge into a series of demos to exemplify all of this.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=0&mode=live&start=90.61600000000003)

[Write an Apache Airflow DAG](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live)

[Let's now plunge into our next example. In](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=0.379) [this we will first write and then run our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=3.669) [first DAG on our Airflow Composer](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=6.81025) [environment. Let's start by examining the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=9.817750000000002) [Python code for our DAG in great detail.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=11.768999999999997) [We begin our Python program with a bunch](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=15.319) [of imports, notably the models](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=18.51899999999999) [BashOperator and PythonOperator models](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=21.354000000000003) [from the Airflow package. We also import](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=23.989) [the datetime model, and we use this in](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=27.843999999999998) [order to construct a variable with](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=30.555249999999994)[yesterday. In other words, we construct](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=33.551500000000004) [the datetime object corresponding to today](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=36.19274999999999) [and then subtract one day from it. We then](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=38.519999999999996) [go ahead and pass this variable into a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=41.799) [structure called default\_dag\_args. This](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=44.903) [data structure is a dictionary, and it has](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=47.649) [just the one key, which is the start\_date,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=50.437181818181806)[and it has the value which corresponds to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=53.339) [yesterday. This start\_date is going to be](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=56.041222222222245) [picked up by our DAG object, and it's](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=57.879) [going to be used to figure out when the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=60.34566666666665) [DAG needs to be run. The docs recommend](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=62.9871818181818) [that we pick a fixed point in time, and if](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=65.18990909090911) [you fix that point in the past, as soon as](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=68.039) [we copy this code into the dags folder,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=71.15899999999999) [the DAG execution will be triggered. Next,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=73.319) [we go ahead and instantiate a models.DAG](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=76.74900000000001) [object. When we copy this into our dags](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=79.89900000000003) [folder of our Cloud Storage bucket,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=82.42799999999998) [Airflow is going to parse this file. It's](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=84.24000000000001) [going to look inside the dags folder for](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=86.63775) [all Python models containing DAG objects](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=88.80757142857144) [in their global namespace. All such](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=91.379) [objects are going to be added into its DAG](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=94.20899999999999) [bag. Note how we also pass in a string](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=97.89899999999996) [identifier, the scheduling interval, which](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=100.96677777777782) [is daily, and the default\_args dictionary](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=102.67233333333334) [we just constructed. And we set up this](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=105.319) [with a context manager, also known as a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=107.81809090909091) [with clause. Any operators which we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=111.41081818181821) [reference inside the body of this with](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=113.66900000000001) [clause are going to automatically be added](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=115.4823333333333)[to the DAG object. So here we have three](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=118.07328571428573) [operators. We have two PythonOperators and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=122.83566666666665) [one BashOperator. Each instance of an](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=125.51757142857142) [operator is called a task. And down at the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=128.15344444444446) [very bottom of the file we define the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=131.4353636363637) [order in which the tasks are going to be](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=133.59354545454545) [completed. Notice how we make use of the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=136.0644545454546)[Python bit shift operator, which is simply](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=138.89081818181825) [a pair of greater than symbols in order to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=141.359) [indicate a dependency. Here, we are](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=144.84900000000002) [telling Airflow to execute the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=147.08024999999998) [hello\_world\_greeting task first, followed](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=148.349) [by the spikeysales\_greeting task, and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=150.74100000000004) [finally, the bash\_greeting. Just as we've](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=154.0865) [used a pair of greater than symbols in](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=156.92) [order to indicate that one task must](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=158.65614285714287) [execute before another, we can also use a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=160.8075714285714) [pair of less than symbols to indicate that](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=164.21899999999997) [one should execute after another. Next,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=167.47024999999996) [let's understand what each of these tasks](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=169.779) [actually does. Let's start with the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=172.551) [bash\_greeting. This is an instantiation of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=174.975) [the BashOperator. We specify a task\_id,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=178.20757142857138) [which is a descriptive string by Bash, and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=180.36399999999998) [then the most important part of this,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=183.1534444444444) [which is the bash\_command which you would](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=185.859) [like this BashOperator to run. Here, our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=187.854) [bash\_command is a simple echo, so we are](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=191.18900000000002) [printing out Goodbye! Hope to see you](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=194.16809090909092) [soon. So this clearly is a goodbye](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=196.1026363636364) [greeting. Let's now turn our attention to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=198.95900000000003) [the two PythonOperators. Each of these has](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=202.0356666666666) [a task\_id, and then, more importantly,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=204.94699999999997) [each of them has a python\_callable. That](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=207.329) [is a Python function, which is simply](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=209.7115) [going to be invoked by this particular](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=212.319)[task. So the hello\_world\_greeting task](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=214.944) [invokes the python\_callable hello\_world.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=216.943) [The spikeysales\_greeting task invokes the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=219.379) [python\_callable greeting. The definitions](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=223.34566666666666) [for these functions are right up here](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=226.11100000000002) [within the same with clause. Notice how](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=228.6756666666667) [both of these functions print and then](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=231.347)[return. The first return's an integer; the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=234.805) [second return's a string. Now these](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=237.13500000000008) [functions, which were invoked by our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=238.93614285714287) [PythonOperators, could have been any](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=240.971) [arbitrary functions at all. They could](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=243.73499999999999) [have been lambda functions or invocations](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=245.98233333333334) [of some global function from somewhere](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=247.9912222222222) [else. So we've instantiated our operators.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=250.03788888888883) [These are called tasks. We have defined](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=253.299) [the order in which those tasks have to run](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=255.00566666666666) [using the Python bit shift operators, so](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=257.709) [we are done creating our DAG. Let's now go](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=260.65757142857143) [ahead and trigger it by uploading it into the dags folder of our environment.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=1&mode=live&start=263.23757142857147)

[Run a DAG on Cloud Composer](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live)

[Now that we've written our DAG, let's go](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=0.235) [ahead and trigger it. The way to do this](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=3.2083333333333335) [is to upload it into our dags folder. So](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=6.693461538461538) [we click on the Upload button and select](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=9.30642857142857) [our python\_bash.py file. As soon as this](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=11.791) [file is added to the bucket, it becomes](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=14.987) [visible to the Airflow service and also to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=17.08642857142857) [the Airflow scheduler. Airflow is going to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=20.705) [keep an eye out for all Python files](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=22.714999999999996) [containing the strings Airflow or DAG](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=24.93785714285714) [somewhere within them. It will then parse](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=27.715) [those files and find any DAG object in the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=30.704999999999995) [global namespace. All of those global DAGs](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=34.33785714285715) [will then be added into something called](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=36.84499999999999) [the DAG bag. And what's more, it's going](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=39.195) [to keep an eye out on our start\_date.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=41.61071428571428) [Because we had set a start\_date to be in](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=44.215) [the past, this is going to trigger](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=46.694090909090896)[immediate scheduling of our DAG. The](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=49.699999999999996) [actual point when our DAG gets executed](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=52.415) [depends on the amount of load within our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=54.235) [Composer cluster. Here, because we don't](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=57.41099999999999) [have a lot of load in our cluster, the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=59.19833333333334) [execution is going to happen right after](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=61.515) [the job is scheduled. To confirm that](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=63.85166666666667) [that's the case, let's go ahead and find](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=65.73) [Composer in the Navigation menu and click](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=67.47875) [through into it. We find our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=70.47071428571431) [spikey-test-environment, and there is a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=73.7075) [link to our Airflow web server. Each Cloud](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=75.80499999999998) [Composer environment has its own web](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=78.84388888888888) [server. You might recall that we had seen](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=80.85055555555554) [some of those web server properties in the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=82.59899999999999) [airflow.cfg file. Let's go ahead and click](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=86.03357142857146) [on that link. We will be asked to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=88.42125) [authenticate ourselves, so we'll need to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=90.59642857142858) [sign in, and once we do that, we are taken](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=91.91045454545456) [into the Airflow web UI. Access to this](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=94.35125) [web server is protected using something](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=97.10214285714288) [known as Cloud Identity-Aware Proxy. This](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=99.64785714285713) [is why we had to sign in before we could](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=103.38576923076923) [access it. And once we go through, we get](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=105.69346153846149) [to a nice UI, which lists all of the DAGs](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=107.47863636363635) [in our environment. Here we have just the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=110.855) [one DAG that's called](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=113.2983333333333) [running\_python\_and\_bash\_operator. Notice](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=114.205) [how it's set to On. That's because it's](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=117.505)[already been scheduled. And that, in turn,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=120.17000000000002) [is because we had set the start\_time to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=122.17500000000001) [yesterday. Notice how the name of the DAG](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=125.58899999999998) [is picked up from the argument we passed](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=127.60899999999998) [into the DAG constructor. This is a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=130.40388888888884) [clickable link, so let's click on the name](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=132.91625) [of this DAG, and that takes us into a tree](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=135.09099999999998) [view which shows the relationship between](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=138.3375) [the various tasks contained within this](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=140.7275) [DAG. Notice how there is color-coding for](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=143.74249999999998) [the two different types of operators, the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=146.45071428571427) [Bash and the PythonOperator, and then over](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=148.575) [on the right we have information](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=150.9575) [corresponding to an individual run or](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=152.685) [execution of this DAG. Because we had](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=155.46642857142854) [scheduled our DAG for daily execution,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=158.21000000000004) [this is identified by the date when you're](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=160.68500000000003) [trying. That is Thursday the 13th. There's](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=163.0566666666667) [also information about each of the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=166.381) [individual stages if we click through. So](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=168.22500000000002) [there's the task ID, the run date and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=171.373) [time, the type of operator, and finally,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=173.03699999999998) [the state. We can see both from these](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=176.245) [individual messages, as well as the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=179.46500000000003) [color-coding on the top right, that each](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=181.51611111111114) [of these stages has been successful. Let's](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=183.91) [click on the graph view. This is going to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=186.505) [give us a different representation of this](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=188.67499999999998) [DAG. Here, we can see that we have blocks](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=190.6875)[corresponding to each of our tasks, and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=193.185) [those tasks have an outline. That outline](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=195.71333333333334) [matches the color-coding for the state.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=198.92749999999998) [When we come back to this UI in just a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=201.245) [little bit, we will find that these blocks](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=203.68666666666672) [are actually interconnected. The UI is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=206.22166666666664) [just a little unpredictable sometimes, and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=208.37) [that's why there are no linkages here yet.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=210.57722222222222) [That will change when we come back to the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=213.235) [graph view in a moment. This graph view is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=215.74928571428575) [a particularly powerful UI. We can view](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=218.7) [the status of each state, but even more](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=220.96875) [importantly, we can click through and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=223.34625) [individually run, clear, or mark as](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=225.84) [successful. Note again that this dialog is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=229.59) [for each run of a particular task, so we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=231.95499999999996) [can click through on each of the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=235.7792857142857) [individual blocks in this graph view and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=237.67749999999998) [get the exact same dialog. This can be](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=239.71166666666667) [particularly useful when we need to change](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=243.37099999999998) [the state of individual tasks in order to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=245.61928571428572) [trigger downstream tasks. In any case,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=249.5183333333333)[let's now close out of this and click on](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=251.8483333333333) [the Task Duration dialog over on the top.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=254.29954545454547) [This is going to give us a graph. The](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=257.245) [graph has task duration on the y axis and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=260.53055555555557) [clock time on the x axis. Each of the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=263.6478571428571) [individual tasks appears on the graph, and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=267.23999999999995) [if we click on the point, we can get](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=269.4230000000001) [information like the task name, the task](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=272.33) [execution duration, and when the task ran.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=275.09611111111104) [For complex jobs with a lot of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=278.215) [dependencies, this can be a really great](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=280.83124999999984) [way to troubleshoot bottlenecks in our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=282.55833333333334) [pipeline. Next, let's go ahead and click](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=285.47) [on the Task Tries option over up top. This](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=287.88642857142844) [is going to give us the number of times](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=290.538) [which it took to run each task. For some](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=293.175) [reason here, each of our tasks it required](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=295.7807142857143) [two attempts. This UI also has information](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=298.97099999999995) [about the landing times. Here, our tasks](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=301.8494444444445) [were actually very short-lived, so it](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=304.4778571428571) [didn't matter a whole lot when they](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=306.58700000000005) [finished, but again, it's a handy tool,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=308.02900000000017) [just like the Gantt view, which is yet](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=310.384090909091) [another option available to us in this](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=313.00409090909085) [viewer. This has each of the tasks as rows](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=314.93863636363614) [and wall clock time as the x axis. Then we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=318.175) [can clearly see when each task started and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=321.8986363636364) [ended. And we can also see what the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=324.79318181818195) [scheduling latencies were between the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=326.7650000000001) [various tasks. We can finally click in](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=329.01900000000006) [through the Details tab to see the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=331.34277777777777) [scheduling intervals, concurrency, and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=334.2099999999999) [other information, as well as the code.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=336.5525) [This is simply the code of our Python](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=339.195) [file, which we had uploaded into the DAGs folder.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=2&mode=live&start=341.8438888888889)

[Explore Composer Web Server](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live)

[Let's continue our exploration of the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=0.466) [Airflow web server for our environment.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=2.8874285714285715) [Let's click on the Browse button up top.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=5.476) [There are various interesting options](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=7.496) [there, including a way to view SLA misses.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=9.162666666666668) [Let's move on from that and click on the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=12.486) [Task Instance information. This, in turn,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=15.916) [takes us to a pane with detailed](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=18.122666666666667) [information about each task. So here we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=20.064) [can see that we have three successful](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=23.23418181818182) [tasks. We have the DAG IDs, task IDs, the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=25.143272727272734)[operators, and so on. Again, this](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=28.795999999999996) [transparency is a refreshing change from](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=31.61171428571429) [the slightly obscure nature of Dataflow.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=34.860285714285716) [We can even see the actual underlying](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=37.466) [compute. By scrolling over to the right,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=40.108499999999985) [we can see the host on which each of these](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=42.43266666666667) [individual tasks ran. Finally, we can](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=46.21299999999998) [click through into the URLs for the logs](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=48.54474999999999) [of each of these tasks. Let's do that, and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=51.194750000000006) [this takes us into a viewer. So this is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=54.048) [not stacked where we're logging. We are](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=56.81099999999999)[still within the web server for this](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=58.05171428571429) [particular Airflow environment. Again,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=60.65) [it's really interesting how Composer has](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=62.681) [its own little world within the broader](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=64.71457142857143) [GCP universe all hosted on this app spot](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=67.62400000000002) [domain. If we click through and scroll](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=70.20171428571425) [down, we can see all of the information](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=72.19314285714283) [emitted by our tasks. We can even see that](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=75.02145454545452) [our task, which printed out a message, has](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=77.97100000000003) [an info log message saying Hello World. We](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=80.96299999999998) [can also see the return value of this](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=84.736) [task, which was 1. Let's click back onto](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=87.08600000000001) [the Browse button and check out the logs](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=89.56885714285717) [of the second task. Here, we can see that](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=91.57600000000002) [the greeting is different. It's Greetings](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=94.14044444444441) [from SpikeySales! Happy shopping. And the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=96.45933333333333) [return value is a string. We can view](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=99.04314285714285) [similar information by clicking on the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=101.674) [Logs button in the Browse menu. In](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=104.06600000000002) [addition to everything we just saw, we can](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=106.75457142857142) [also view a complete record of our own](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=109.04885714285716) [actions in this log viewer. So we can see](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=111.22099999999999) [how we access the tree view and then the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=113.67199999999998) [graph view, the duration graph, and so on.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=116.53236363636363) [Finally, let's check out how to go ahead](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=119.456) [and trigger a new run of our DAG. In the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=121.436) [Browse menu, we click on DAG Runs. This](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=124.90155555555555) [takes us back out into the top-level](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=126.93488888888888) [window. This is where we had begun. Let's](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=130.00711111111113) [click through into our DAG into the graph](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=131.775) [view, and we can see that the blocks are](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=134.16700000000006) [now connected up. There was probably a bit](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=136.65509090909097) [of a lag in the construction of this view.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=138.576) [Let's use this UI to actually run our DAG.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=142.406) [Let's click through into one of the tasks](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=144.446) [and click on the Run button. However, it](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=146.436) [does not actually work. The error message](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=149.45600000000002) [tells us that the task instance has](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=152.11933333333337) [current state success, and that's not a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=153.97933333333333) [valid state for execution. So we've got to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=157.436) [clear that, so we click back into the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=160.23999999999995) [graph view, clear the current state so](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=162.2285) [that it no longer shows a success, and now](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=164.85225)[we are ready to actually run. When we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=168.1685) [return to the DAG view, we will find that](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=170.99742857142854) [our DAG execution has triggered. We can](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=173.77266666666668) [tell this from the bright green little box](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=176.058) [saying that the state is running.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=178.466) [Initially, the outlines of each of our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=180.496) [tasks is dark gray, indicating that the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=183.05975000000007) [status is queued. We can also confirm that](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=186.07933333333335) [by hovering over the individual blocks.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=188.18457142857142) [Now we are going to continue to monitor](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=190.486) [this Airflow web server until our task's](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=192.87800000000004) [status moves forward. One important note](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=196.3926666666667) [in this context, the Composer web server](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=199.13850000000002) [UI needs to be refreshed in order to fetch](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=202.2004444444444) [the latest status. It's not going to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=205.58314285714283) [auto-update, so in this demo and in all of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=208.09000000000003) [the subsequent demos, whenever we see the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=211.346909090909) [state of the UI updating, that's because](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=213.75377777777777) [we are explicitly refreshing the web](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=216.21800000000002) [browser window. So we periodically hit](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=218.64200000000002) [Refresh on our browser window. If we wait](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=221.226) [for a bit, we see that this task is now](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=224.0667142857143) [running, and shortly thereafter the State](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=226.20242857142873) [turns to success. And in the same way, we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=228.32849999999996) [can keep going on to the next task. That's](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=230.7702857142857) [successful as well, and so is the last](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=232.892) [task. We have successfully triggered the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=236.0599999999999) [re-execution of our DAG from within the web server.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=3&mode=live&start=238.96433333333331)

[Use the All\_success Trigger Rule](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live)

[Let's now plunge into our next demo in](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=1.117) [which we explore the use of the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=3.5306363636363636) [all\_success trigger rule. Remember that](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=6.076090909090907) [all operators have a trigger rule](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=8.042555555555555)[argument. This defines when that](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=10.669222222222217) [particular operator is going to be](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=12.722999999999999) [triggered. The default value for the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=14.79366666666667) [trigger rule is all\_success, which means](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=16.799222222222223)[that all of the directly upstream tasks](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=18.69985714285714) [need to have succeeded. Let's switch into](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=21.11033333333333) [code, and let's check out a new task where](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=23.87825) [we explore this particular trigger rule.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=26.738999999999997) [Most of this code is similar to the last](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=29.127) [example, so we won't dwell on it. We begin](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=31.562555555555555) [with a bunch of import statements. We](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=33.894499999999994)[define a variable with the start\_date of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=36.44811111111111) [yesterday so that our DAG is triggered as](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=38.83588888888889) [soon as we upload it to the dags folder.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=41.45588888888887) [But then here's something new. We](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=44.167) [explicitly set the number of retries to be](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=46.54985714285714) [1. By default, that's 0. We also specify](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=49.67271428571429) [that we would like to wait for an interval](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=51.81033333333333) [of 2 minutes before we attempt a retry.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=54.239727272727265) [Then comes the context manager. That's the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=57.127) [with clause in which we instantiate our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=59.733) [DAG. Remember, it's got to be in the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=61.85399999999998) [global namespace, and we pass in the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=64.46699999999998) [default\_args. The body of this with clause](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=68.42699999999998) [is pretty familiar. We have two Python](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=70.48033333333332) [functions, hello\_world and greeting, and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=73.16700000000002) [then we have two PythonOperators, which](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=75.49033333333333) [specify those functions as their](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=77.72414285714285) [callbacks. Notice that with both of these](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=80.55985714285713)[PythonOperators we have left out this](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=82.85842857142858) [trigger rule, and so by default it's going](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=85.2755714285714) [to be all\_success. Now in the third](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=88.14700000000003) [operator that we define in our DAG, which](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=90.24790909090906) [is the BashOperator, we will explicitly](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=92.71842857142857) [add that trigger rule back in. Notice how](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=96.087) [we do so using the TriggerRule.ALL\_SUCCESS](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=98.687)[enumerated value. Again, this is already](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=101.42033333333333) [the default, so technically we need not](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=105.42699999999998) [have specified this, but this bit of code](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=107.37824999999998) [will tell us how we can go ahead and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=109.26366666666665) [specify the trigger rule. And now, this is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=112.36255555555556) [where it gets really interesting because](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=115.44255555555553) [I'm going to turn back to a bit of code](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=117.23842857142857) [which I glossed over. Let's focus our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=119.61700000000002) [attention on the hello\_world function.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=122.23074999999999) [When we look closely, we see that this](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=124.137) [function is going to raise a ValueError](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=125.91477777777783) [and say that something went wrong. And](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=128.147) [this means that the hello\_world\_greeting](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=130.65366666666665) [PythonOperator is going to fail, and that,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=133.087) [in turn, is going to cause our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=135.82700000000003)[bash\_greeting operator to not be triggered](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=138.137) [at all. The reason for this is that we've](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=141.11450000000002) [specified using the Python bit shift](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=143.89199999999997) [operator that we would like](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=146.60533333333336)[hello\_world\_greeting to trigger](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=149.48899999999995) [spikeysales\_greeting, and that, in turn,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=151.43366666666668) [will trigger the bash\_greeting. And](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=153.14199999999997) [because our bash\_greeting has a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=154.59842857142857)[trigger\_rule of ALL\_SUCCESS, that's not](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=156.70557142857146) [going to happen. Let's see how this plays](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=159.3955714285715) [out in practice. Let's switch back into](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=162.3595) [the DAG web server where the first thing](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=164.14699999999996) [that we are going to do is to turn off the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=165.96099999999998) [DAG that we had uploaded in the previous](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=168.79255555555557) [example. Let's turn that off and then](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=171.741)[switch over into the Environments tab, and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=173.6395) [there, let's click on the DAGs folder. The](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=176.6036666666667) [first thing that we are going to do there](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=179.365) [is to select and delete the Python script](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=181.147) [corresponding to our previous DAG. Now](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=184.127) [this is a good place for us to discuss the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=187.289) [importance of keeping the DAGs folder of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=189.4012857142857) [our Composer environment clean. Composer](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=191.761) [intentionally makes it really easy to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=194.63033333333334) [trigger a DAG. However, in some ways,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=197.36200000000002) [Composer makes it almost too easy. If, for](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=199.75700000000003) [instance, you were to rename this Python](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=202.75500000000002) [file in the DAGs folder, having disabled](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=204.84800000000007) [the job would not prevent it from being](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=207.40449999999998) [executed. The operation of our DAGs is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=211.5255714285714) [inherently not idempotent. DAGs are going](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=214.78033333333332) [to perform operations like executing shell](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=217.11199999999997) [scripts, creating or taking down clusters,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=218.9841428571429) [and sending email, so we've got to be very](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=220.963) [mindful about not triggering inadvertent](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=223.85414285714293) [execution. And that's why we are going to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=227.31300000000005) [be abundantly cautious and keep deleting](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=229.46324999999996) [our Python files from the DAGs folder.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=232.182) [This is not something that we would need](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=235.097) [to do say with Dataflow, where the process](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=235.96100000000004) [of triggering a Dataflow job was very,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=239.12450000000004) [very explicit and quite cumbersome. So](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=241.63200000000003) [let's delete that particular file, and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=243.49200000000002) [then let's go ahead and reupload the file](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=245.49588888888889) [with our new and modified DAG. As before,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=248.127) [Airflow is going to pick up on this file](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=251.647) [being added to the bucket. It will pass](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=253.9195) [it, find that it has a DAG object in the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=256.2315454545454) [global namespace, calculate that the start](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=259.7747777777778) [date was set for yesterday, and schedule](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=261.8081111111112) [it. If we now switch back into our Airflow](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=263.8784285714284) [web server, we will find that this new DAG](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=267.30299999999994) [does indeed show up there, but it's not](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=270.4203333333332) [been successful. It's up\_for\_retry. The](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=272.6545000000001)[immediate reason for this is that we had](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=275.40575) [specified that the number of retries was](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=277.43414285714283) [equal to 1, but when we click through,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=279.49255555555555) [that up\_for\_retry attempt is not going to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=282.177) [work either. The reason, of course, for](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=285.2647777777779) [that is that we have intentionally thrown](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=287.14200000000005) [an exception from one of our tasks. This](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=289.0258888888889) [is something that we can view in the logs,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=292.437) [and remember that the log URL is available](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=295.137) [on the extreme right of the DAG](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=297.177) [information. So we click through, and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=300.6070000000001) [there we can find the exception. The](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=302.4924545454544) [ValueError with the message Oops!](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=304.563) [something went wrong, has prevented the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=306.6395) [successful execution of task one. Let's](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=309.62825) [now drill down into the individual task](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=312.43271428571427) [instances, so we click on DAGs, we click](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=314.57557142857144) [through into the DAG details, and there we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=317.7241428571428) [can see that Airflow is attempting to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=320.4312857142857) [retry our task. That's why the State is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=323.13199999999995) [running. However, when we click through,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=325.8219999999999) [we can find that the individual task](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=328.087) [states have Operator: null, and that, in](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=329.86325000000016) [turn, is because Airflow is still trying](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=332.14366666666666) [to retry the first Python task. Now, if we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=335.14899999999994) [switch to the graph view, we will see that](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=338.89075) [python\_1 is queued. In a minute, that is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=341.8555714285715) [going to show a failed status, and that is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=344.49154545454536) [because python\_1 had that exception in](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=347.60800000000006) [there. Remember that the default trigger](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=350.59000000000015) [is all\_success, so if python\_1 fails,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=353.25842857142845) [python\_2 is not going to be triggered at](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=355.8412857142858) [all. Its status simply shows as](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=358.78533333333326) [upstream\_failed. And likewise, if we click](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=361.6503333333333) [through into bye\_bash, that also has the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=364.0257499999999) [same state, which is upstream\_failed. The](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=366.93811111111114) [default trigger rule of all\_success can](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=369.66533333333336) [also be seen in action in the Gantt view.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=372.41200000000003) [We can see here that there is a big, red](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=375.157) [rectangle for the failed python\_1 task,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=378.7297272727274) [and then we can find that python\_2 and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=380.62200000000007) [bye\_bash do not ever even get started.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=383.6449999999999) [They were never triggered because they had an upstream failure.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=4&mode=live&start=387.117)

[Use the One\_failed Trigger Rule](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live)

[Let's now move into another example in](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=0.62) [which we demonstrate the use of the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=2.958333333333333) [one\_failed trigger rule. This is going to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=5.4239999999999995) [cause a task to fire as soon as at least](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=7.557777777777776) [one parent has failed. That task will not](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=10.341111111111113) [wait for all of its parents to complete.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=13.006666666666666) [Let's plunge back into the code, which is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=15.68) [almost identical to the previous example.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=18.415000000000003) [As usual, we have a context manager.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=20.68) [That's a with clause in which we define a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=23.6) [DAG in the global namespace. In the body](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=26.138333333333335)[of this with clause, we have a function](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=29.470000000000002) [hello\_world, which throws an exception in](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=31.454000000000004) [its first line. This function is going to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=33.53250000000001) [be the Python callback for a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=36.28888888888888)[PythonOperator, which is obviously going](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=38.424) [to fail as a result. So far, all of this](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=40.49714285714286) [is identical to the previous example. The](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=44.40818181818184) [one change now comes in the BashOperator.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=46.965) [This is the bash\_greeting. The trigger](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=49.59) [rule is now ONE\_FAILED rather than](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=51.75999999999999) [ALL\_SUCCESS. Remember that the default](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=55.059999999999974) [value of the trigger rule is all\_success,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=56.5211111111111) [and that's why we were able to omit it](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=58.1525) [from the two PythonOperators right above](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=60.845000000000006) [this. With this one change, this DAG is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=63.27500000000001) [going to execute successfully. Let's](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=65.67) [switch back into the Airflow web server](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=68.05250000000001) [and turn off our previous DAG. Remember](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=70.66) [that that one had failed because python\_1](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=73.045) [had thrown an exception, and the other two](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=75.67) [operators were both triggered on](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=78.22428571428571) [all\_success. In any case, we can delete](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=81.0457142857143) [this Python file from the DAGs folder so](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=83.63666666666664) [that it no longer gets in the way and is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=86.3) [not triggered for execution. Then let's go](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=89.41999999999999) [ahead and upload our new Python file. This](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=91.52300000000001) [one is called one\_failed\_python\_bash.py.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=94.628) [As usual, as soon as we upload into the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=98.62) [DAGs folder, Airflow is going to detect](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=101.11545454545458) [that this file has a DAG object in the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=103.33111111111114) [global namespace, it has a start date in](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=106.78857142857146) [the past, and it will be scheduled for](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=109.1475) [execution. So let's switch into the DAG](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=112.1957142857143)[web server, and there we can see that our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=114.8775) [DAG is already running. We can see that](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=117.5263636363636) [from the green circle in the DAG Runs](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=119.84076923076923) [field. Let's click through and there](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=122.30230769230768) [switch to the graph view. This gives us a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=124.11500000000001) [nice representation of the connected](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=127.23599999999999) [tasks. Note how the overall task status is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=129.25599999999997) [currently running. Our python\_1 task is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=132.7711111111112) [up\_for\_retry. That's because it threw an](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=136.02) [exception, of course. And then we can see](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=137.885) [that it fails, but the task as a whole now](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=139.9) [has Status success. And the reason that](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=143.42200000000008) [happened is because when task\_id python\_1](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=145.62) [failed, that also triggered a failure of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=147.64666666666665) [task\_id python\_2, so the State got set to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=152.02600000000004) [upstream\_failed, and that, in turn, was](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=156.1614285714285) [enough to trigger the execution of the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=157.27124999999995) [bye\_bash task, and that went through](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=160.32) [successfully. The reason that this worked](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=163.25599999999997) [the way it did is because we had specified](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=164.77111111111114) [that the trigger rule on bye\_bash was](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=167.29333333333327) [one\_failed, so this task was triggered as](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=169.9157142857143) [soon as at least one parent failed. It](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=172.57299999999998) [does not wait for all parents to be done.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=175.071) [We can get further visual confirmation of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=178.59)[this by clicking on the Gantt button up](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=180.799) [top. Here, we can see that, as in the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=182.47100000000003) [previous example, the python\_1 task](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=184.45777777777784) [failed. That, of course, was because we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=187.06400000000002) [threw an exception in the first line of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=188.99333333333337) [that function. That immediately caused the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=191.7742857142857) [task python\_2 to fail as well. That's](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=194.22000000000003) [because it had experienced an upstream](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=196.99375) [failure, and it had the default trigger](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=199.23625) [rule of all\_success. But now there was](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=201.62333333333328) [enough for the last task to be triggered](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=203.53666666666663)[because it had the trigger rule of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=205.65000000000003) [one\_failed, and that went through](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=207.9057142857143) [successfully causing the overall status of the DAG as a whole to be set to success.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=5&mode=live&start=209.3842857142858)

[Use the All\_done Trigger Rule](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live)

[Trigger rules are a really handy way to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=0.841) [construct complex pipelines, and that's](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=3.3735) [why we are going to explore yet another](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=5.366) [trigger rule, this one called all\_done.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=7.586) [The all\_done trigger rule means that a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=9.881) [task is going to be fired as soon as all](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=12.436000000000002) [of its parents are done with their](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=14.47827272727272) [execution. Done includes all tasks which](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=17.301) [have succeeded or failed, but it does not](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=19.485444444444443) [include tasks which have been skipped.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=22.041000000000004) [Let's code this up really quickly. So we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=23.841) [switch back into code. The code starts](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=26.48766666666667) [with a models.DAG being instantiated in](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=29.11385714285714) [the global namespace exactly as before,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=31.813499999999998) [and then within the body of the with](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=34.821) [clause, or the context manager, here is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=37.460999999999984) [something new. The hello\_world callback is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=40.086) [the same as before. It throws an](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=42.33099999999999) [exception, but the greeting callback has](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=44.93225) [changed because now it too has been](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=47.13322222222222) [tweaked to raise a type error, Incorrect](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=49.45877777777777) [type, in its first line. Because both](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=52.0000909090909) [their callback functions throw exceptions,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=54.701) [both of our PythonOperators are going to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=56.851) [show up as failed, and that, in turn, is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=59.16099999999999) [going to trigger the execution of our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=61.92800000000001) [BashOperator, which has a trigger\_rule set](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=65.199) [to ALL\_DONE. Note that if we had not](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=67.94814285714284) [thrown the exception from within the body](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=70.15766666666667) [of the callback for spikeysales\_greeting,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=71.97385714285717) [it would have counted as a skipped task,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=73.83433333333333) [and it would not have triggered the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=76.85099999999998) [following task. Let's now run this as](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=79.619) [usual. So we turn off our last DAG, we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=81.9717692307692) [delete the Python file from the DAGs](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=84.19433333333333) [bucket so that it doesn't trigger](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=86.52766666666663) [needlessly, and then we go ahead and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=88.52211111111114) [upload our new Python file, this one with](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=90.97225) [the all\_done trigger. Once it's uploaded](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=94.341) [as usual, it's going to be picked up by](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=96.69385714285714) [Airflow. It's got a start date in the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=99.48933333333332) [past, so if we switch back to the web](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=101.54475000000002) [browser and go into the DAGs section,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=103.56877777777783) [there it already shows up. It's already](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=105.98372727272724) [been scheduled. Let's go ahead and click](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=108.80100000000002) [through into it and switch to the graph](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=110.46600000000002) [view. Here, we can see that it's running,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=113.30433333333332) [so the overall status of the DAG is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=115.791) [running. Let's wait for just a little bit,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=118.5021111111111) [and that status changes to success. As](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=120.791) [always, let's hover over each of the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=123.18266666666666) [individual tasks to understand what](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=125.60099999999998) [happened. Task\_id 1 failed. That was as](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=127.50099999999996) [expected. That's because its Python](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=131.27528571428567) [callback threw an exception of ValueError](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=133.33100000000002) [in the first line. Task number 2 failed as](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=135.81766666666667) [well. This one actually failed with the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=139.46933333333328) [State upstream\_failed. That's because this](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=142.08849999999995) [had a default trigger rule of all\_success,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=143.961) [and its immediate parent happened to fail.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=146.70433333333332) [However, you might recall that we had](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=149.831) [thrown an exception from the first line of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=151.581) [this task as well. That was important](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=153.7528181818182) [because there was no way to know in](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=155.961) [advance that the predecessor was always](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=158.5835) [going to fail, and that, in turn, triggers](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=160.26475)[the successful execution of the last task](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=163.33766666666665) [here, which had the trigger condition of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=165.5543333333333) [all\_done. We can see from this that a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=168.45100000000005) [status of upstream\_failed counts as a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=171.62499999999997) [failure, and it's not a skip. That is why](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=173.80766666666662) [our BashOperator was successfully](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=177.32475) [executed. If we switch to the Gantt view,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=179.32975) [we can see something interesting there.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=181.791) [Both the second and the third tasks in our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=183.861) [pipeline had an immediate predecessor](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=187.40700000000004) [which failed. However, the second task did](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=189.8143333333333) [not execute at all, and that's because it](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=192.47100000000006) [had a trigger rule of all\_success. The](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=195.007) [third task, on the other hand, had a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=196.981) [trigger rule of all\_done, and that's why](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=198.86766666666668) [it was indeed executed. Trigger rules can](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=202.13100000000003) [be mixed and matched to put together](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=204.70814285714283) [really complex pipelines, so it's](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=206.86100000000002) [important for us to understand the semantics thoroughly.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=6&mode=live&start=208.44528571428575)

[Specify Python Dependencies](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live)

[A great attraction of Google Cloud](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=0.446) [Composer and Apache Airflow is that they](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=2.177428571428572) [impose no platform dependence at all. Our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=4.986) [Python file can run just about anywhere.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=7.7935) [All that we need to do is to specify our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=10.436) [Python dependencies. In this example,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=13.227999999999998) [we'll see how that's done. Let's switch to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=15.537249999999998) [code. We have a bunch of import](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=18.156) [statements, including the stats model from](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=20.120285714285707) [the SciPy package. As an aside, we chose](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=22.331000000000007) [SciPy for this example because this is not](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=25.11933333333334) [installed by default on the nodes in our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=28.12885714285714) [Composer cluster. Had we chosen NumPy,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=31.548857142857134) [that would have worked just fine without](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=33.431000000000004) [explicitly adding it to the requirements](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=35.47600000000001) [list. The import statements are actually](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=37.996) [the most novel part of this code. After](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=40.436) [that, it's pretty familiar. We define the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=42.876)[default\_dag\_args, including the start\_date](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=45.936) [of yesterday. We instantiate our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=48.248) [models.DAG object within the global](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=51.26199999999999) [namespace and set it up in the with](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=53.57225) [clause, also known as the context manager.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=56.61599999999999) [And then within the body of that with](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=59.416) [clause, we have one single task. This is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=61.24711111111111) [going to print the most common number in](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=64.93766666666666) [an array. And this is where the SciPy](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=66.98433333333328) [package is required, when we make the call](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=69.48266666666667) [to stats.mode. We pass this as the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=72.61885714285715)[callback into a PythonOperator, and that's](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=74.89742857142858) [really it. Because we have just the one](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=77.47933333333332) [operator in this DAG, the last line in our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=80.27400000000002) [code is simply the name of the operator.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=83.31600000000002) [We do not make use of the Python bit shift](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=85.486) [operators at all. That does it for the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=88.54753846153848) [code. Let's switch back into the web](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=90.30766666666668) [console. We've cleaned up the state after](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=92.99600000000001) [our last example, so we are now going to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=94.79600000000002) [go ahead and upload this file into our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=96.92599999999997) [DAGs folder. And our expectation might be](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=100.42099999999999) [that this is going to be immediately](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=102.86171428571427) [picked up by Airflow and scheduled. Let's](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=104.8431428571429) [check whether that indeed happened by](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=106.82933333333332) [clicking on the Airflow web server link.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=108.98599999999999) [But here is something new. We have a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=112.416) [broken DAG, so this DAG could not actually](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=115.332) [be scheduled for execution. The reason for](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=117.846) [that is that Composer could not find a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=120.31600000000002) [model named SciPy. Clearly, SciPy is not](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=123.72171428571431) [used often enough for it to count as a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=126.01742857142858) [standard dependency, so we are going to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=128.69600000000003) [have to go ahead and configure a custom](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=130.01377777777773) [Python dependency. For this purpose, let's](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=132.48266666666666) [conduct a little before-and-after](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=135.04600000000005) [exercise. Let's click into our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=136.951) [environment, and there let's click on the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=139.07199999999997) [list of PYPI PACKAGES over on the far](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=141.156) [right. And when we do this, we find that](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=144.06975) [the list of required libraries is empty.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=146.0380000000001) [No PyPI packages have been added so far.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=148.456) [To change that, we create a very simple](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=151.476) [text file where each line corresponds to a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=153.8760000000001) [package specification. The format of this](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=157.476) [package specification is pretty much the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=160.45600000000002) [same as a pip requirements file. So we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=162.64200000000002) [have a package, then an extras list, and a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=164.89155555555558) [version specifier. Here we have just one](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=167.961) [line requesting a version of SciPy greater](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=170.87171428571435) [than or equal to 1.1. In order to get this](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=173.44600000000003) [into our Composer cluster, let's switch](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=177.12377777777772) [back into Cloud Shell. There we use the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=179.45600000000002) [Upload button in the top right to upload](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=182.63200000000003) [our requirements.txt. This will now be](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=185.44599999999997) [accessible in the working directory of the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=187.80822222222218) [Cloud Shell terminal. We can use the ls](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=190.654) [command to verify that the upload is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=193.34236363636364) [successful and then the pwd command to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=195.03028571428572) [check where we currently are. Once that's](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=198.75433333333334) [done, we can execute the gcloud composer](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=201.2035)[environments update command. We've got to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=204.2235) [pass in the name of the Composer](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=207.28145454545458) [environment, which here is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=209.1841818181819) [spikey-test-environment, and then various](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=210.986) [flags. The important flag here that we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=212.98850000000002) [wish to use is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=215.4393333333333) [update-pypi-packages-from-file followed by](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=217.941) [the location of the requirements.txt. As](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=220.59742857142857)[an aside, we also could have uploaded this](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=223.68099999999998) [requirements.txt file to a Cloud Storage](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=225.95850000000002) [bucket and passed it into the same](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=228.91350000000006) [command. In addition, we specified the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=231.18885714285716) [location, which is us-central1, and the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=233.13600000000005) [async flag, which means that this command](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=235.6088571428571) [will run in the background and return](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=237.8874285714286) [without waiting for the operation to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=240.56314285714288) [finish. And indeed, when we run the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=243.022) [command, we see that there is an update in](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=244.75266666666658) [progress for our environment. Under the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=247.24) [hood, there's actually going to be a pull](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=248.9585) [happening from the Google Container](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=251.2235) [Registry, and a Docker container with](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=253.11724999999998) [whatever requirements we specify is going](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=255.92100000000005) [to be made available to our nodes in the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=257.8560000000001) [Kubernetes cluster. We need not bother](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=261.5471111111112) [ourselves those implementation details. If](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=263.96100000000007) [we now switch back into the DAGs view, we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=265.8193333333333) [find that the error has vanished, and our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=268.896) [DAG now appears. This happens dynamically](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=272.1760000000002) [because the Airflow service has a daemon](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=274.30171428571435) [which is checking for the contents of the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=276.47599999999994) [DAGs folder, and as soon as it finds that](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=279.032) [it can successfully parse any models in](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=281.7548888888889) [there, it will go ahead and show them up](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=284.1271111111112) [here. And the rest of this example is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=287.1059999999999) [pretty straightforward. We can click](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=289.0304444444443) [through and see the tree view or the graph](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=290.40676923076916) [view and confirm that the DAG has executed](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=293.16907692307666) [successfully. As always, we can use the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=296.91474999999986) [logs in order to find the actual return](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=299.0641818181817)[value, and when we click through, we can](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=301.44933333333336) [find that the mode was indeed calculated](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=304.12711111111116) [using the stats.mode invocation. So we've](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=306.476) [clearly successfully made use of a custom dependency from within our Composer DAG.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=7&mode=live&start=311.0926666666667)

[Create a Dummy Operator](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live)

[In this demo, we will see how to make use](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=0.559) [of a DummyOperator in a pipeline. We will](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=2.569) [then demonstrate its use in implementing](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=5.735666666666667) [branching. Let's get started with a Python](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=9.055666666666667) [code file. As usual, the beginning is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=11.821500000000002) [pretty familiar. We import datetime, we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=14.701857142857143) [set up yesterday as the start\_date, and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=17.551000000000002) [then we initialize the default\_dag\_args.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=21.042333333333335) [Then we create a models.DAG object, and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=23.559) [into this object we pass in a descriptive](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=27.005000000000003) [name, the scheduling interval, and the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=30.17300000000001) [default arguments. The default arguments](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=32.69757142857143) [can then be used in any of the operators.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=34.01185714285714) [This allows us to not pass them in](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=36.619) [repeatedly. The default\_args dictionary](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=40.11233333333334) [will be available to them all. Note that](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=41.555666666666674) [we do this in the global scope, and we put](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=44.02677777777778) [this in a with clause, or a context](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=46.86150000000001)[manager. Then in the body of the with](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=50.1481666666667) [clause, we have a greeting function. This](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=52.31774999999999) [one does not throw any exceptions. It](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=54.84042857142857) [simply returns that the greeting was](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=56.922333333333334) [successfully printed. We then go ahead and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=59.25233333333333) [use this method as the python\_callable in](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=61.822750000000006) [a PythonOperator. This has the task\_id](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=65.24233333333333)[hello\_python. Next is a BashOperator where](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=68.98700000000001) [we simply echo our goodbye message. At the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=71.25566666666664) [very end of all of this is the final](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=75.10733333333333) [operator, and this is the new bit here.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=77.34983333333334) [This is a DummyOperator. It has a task\_id,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=79.579) [but it has no body. It has no](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=82.94788888888891) [python\_callable, so it doesn't really do](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=85.806) [anything. DummyOperators can seem kind of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=88.2) [pointless, but they actually play an](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=90.28233333333336) [important role, for instance, in](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=92.04042857142858) [branching. Finally, we can define the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=94.11649999999999)[dependencies between these different tasks](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=97.06899999999997) [using the Python bitwise shift operator.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=99.167) [So the DummyOperator comes over at the end](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=102.549) [after the bash\_greeting, which, in turn,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=104.619) [is after the python\_greeting. Let's run](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=106.629) [this pipeline. As usual, let's switch back](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=110.094) [into the browser where we start by](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=112.46024999999997)[deleting our pre-existing Python files in](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=114.73042857142858) [the DAGs bucket. Once these have been](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=117.084) [deleted, we will go ahead and upload our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=119.46122222222223) [new Python source file. Remember that all](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=121.8832857142857) [Python files in the DAGs bucket are going](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=124.92233333333334) [to be parsed by Airflow. It will search](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=128.12614285714287) [for any DAGs in the global namespace and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=130.76299999999998) [go ahead and schedule them. And so once we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=133.88233333333335) [switch back to the web server of our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=136.37299999999996) [Composer environment, we will see that our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=138.46328571428572) [newly added DAG is indeed on. Also, we can](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=141.35649999999998) [click through. Because we had specified a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=144.80499999999998) [run start date in the past, this DAG is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=147.39354545454552) [already executed. We can see that it's](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=150.771)[currently in the status running, but the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=153.094) [first task has already succeeded, and if](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=155.18328571428574) [we just wait for a short while, the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=157.28122222222223) [following pipeline operators get executed](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=160.09275) [as well, and very quickly the overall](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=162.56150000000002) [status changes to success. We can get a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=165.25455555555553) [sense of how exactly the tasks executed by](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=167.79899999999995) [clicking into the Gantt view. We can see](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=170.1575714285714) [that the hello\_python task executed first.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=172.94899999999998) [This went through successfully. Then after](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=175.589) [some time, the BashOperator was executed,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=178.25566666666668) [and finally, our dummy task. That was the last task in the pipeline.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=8&mode=live&start=180.4575714285714)

[The BranchPythonOperator](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live)

[Now that we've seen how DummyOperators can](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=0.265) [be created, let's do something useful with](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=2.598333333333333) [them. In this demo, we will make use of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=4.923333333333334) [our DummyOperator for branching. This will](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=6.899) [also allow us to introduce the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=9.806428571428572) [BranchPythonOperator. Let's switch back](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=12.25) [into our Python code, which, as usual,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=14.315) [begins with the import statements and the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=16.315) [default arguments. Then comes the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=18.464999999999996) [models.DAG definition, and then finally is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=21.071) [the important bit. We have a function](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=23.98357142857143) [here. It's called makeBranchChoice. This](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=26.840999999999994) [is a Python function which returns one of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=29.567857142857143) [two possible values. Depending on the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=32.501)[choice of a random number which generates](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=35.01875) [internally, it will either return](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=37.083000000000006) [hello\_spikey or dummy. Now that may not](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=39.891000000000005) [seem like a very meaningful thing to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=43.18722222222223) [return until we notice that down below is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=44.983888888888885) [a PythonOperator whose task\_id is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=48.027857142857144) [hello\_spikey, and right down even further](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=51.54214285714285) [below that is another operator whose](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=53.9061111111111) [task\_id is dummy. Once we notice this, our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=56.435) [function makeBranchChoice seems to make a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=60.413571428571416) [lot more sense. This function returns the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=62.42214285714286) [task ID of the next task to be executed,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=64.615) [and that task ID is determined on the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=68.275) [basis of some conditional. Now, a natural](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=70.92500000000001) [question here would be how does Airflow](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=73.13357142857141) [know that the return value of this](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=75.40124999999999) [function has to be used to determine the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=77.855) [next operator, and, of course, the answer](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=80.46699999999998) [is this requires the use of a special](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=82.76500000000001) [operator called the BranchPythonOperator.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=85.5707142857143) [The BranchPythonOperator takes in a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=87.325) [python\_callable. This python\_callable is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=90.62499999999999) [going to return the task ID of the next](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=92.30000000000001) [task. Whatever task ID this callable](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=95.87785714285712) [returns is going to be followed. All other](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=98.305) [parts in our DAG are going to be skipped.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=100.81772727272728) [And this task ID must be referencing a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=103.305) [task directly downstream from this](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=106.45700000000005) [particular BranchPythonOperator. Now we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=109.65700000000001) [have to jump around this code a little bit](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=111.52) [in order to make sense of it. But now that](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=113.179) [we've seen what makeBranchChoice actually](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=116.14357142857143) [does, let's move on linearly. After this](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=117.96833333333333) [function is a dummy task, a DummyOperator](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=121.82357142857144) [called run\_this\_first, which is always](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=124.78500000000001) [going to be executed before the branch.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=127.46300000000001) [Next comes the BranchPythonOperator, which](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=130.235) [we just discussed. Notice how the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=132.515) [python\_callable into this is the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=134.775) [makeBranchChoice function. We then define](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=137.76) [the first part of the pipeline, so we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=140.26833333333332) [would like to run\_this\_first operator to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=142.85214285714287) [precede the branching operator. In this](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=144.88899999999998)[example, for the first time, we will be](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=147.8307142857143) [splitting up our DAG into different](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=149.70785714285716) [constituent steps. Next comes a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=152.28000000000003) [straightforward PythonOperator. This is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=156.035)[our familiar hello\_spikey. We then have a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=158.07100000000003) [pair of DummyOperators, which are going to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=160.9992857142857) [be used on each of the two parts of our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=162.77999999999997) [branch. One of these follows the Python](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=165.82499999999993) [branch, while the other is the sole task](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=167.9678571428572) [in the other branch. And finally, the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=170.8004545454546) [joining state, which is called](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=172.897) [bash\_greeting. This is where the two](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=175.50750000000005) [branches of our conditional reconverge.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=177.12666666666672) [Notice how this has a trigger\_rule of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=179.325) [one\_success. This means that exactly one](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=182.78125000000003) [of its parents needs to succeed. Because](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=184.54375) [only one of those parts is going to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=187.00785714285718) [execute, we cannot have the default](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=189.93499999999995) [trigger rule of all\_success. And now](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=192.49277777777777)[finally we define the remainder of our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=194.883) [pipeline. There are two possible parts.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=197.01100000000002) [Both begin with branching, and both end](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=199.245) [with the bash\_greeting. Only one of these](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=201.78000000000003) [two parts can be hit, and which of those](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=204.15166666666664) [parts it's going to be depends on the task](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=206.1738888888889) [ID returned inside the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=208.62500000000003)[BranchPythonOperator. Let's go ahead and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=211.26166666666668) [give this code a spin. We've got to delete](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=212.72500000000002) [any old files if they exist. If not, we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=214.517) [can merely upload this particular Python](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=217.499) [file. As always, it's instantaneously](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=219.88699999999997) [going to be picked up and scheduled](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=221.62277777777777) [because of the start date which we had](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=224.14071428571427) [specified to be yesterday. That is in the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=227.10357142857146) [past. If we now click into this DAG, we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=229.091) [will see that its tree view looks a lot](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=231.58045454545456) [more interesting than any of our pipelines](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=233.9695454545456) [so far. However, let's switch to the graph](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=236.5) [view because that's just a lot easier to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=238.95214285714292) [make sense of, and here we can really see](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=240.51874999999998) [the logic of our program. Our DAG has a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=243.15214285714282) [conditional in there, and based on the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=246.9807142857143) [choice generated in the branching](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=249.61166666666668) [operator, only one of those two parts is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=251.3) [going to be executed. As always, we can](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=253.96611111111108) [hover over the individual tasks and see](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=256.62388888888887) [what's going on under the hood. We can](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=259.0275) [tell that this first task has gone through](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=261.5607142857143) [successfully. The branching task is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=263.81) [currently queued. If we wait for a little](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=266.285) [bit, one of these two parts is going to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=268.48699999999997) [have to be triggered. There's a moment of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=270.40611111111116) [suspense, and then the highlight passes](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=272.863) [into the lower branch, so we know it's the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=274.9299999999999) [dummy that's being executed. And shortly](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=277.645)[thereafter, the pipeline as a whole has](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=280.04499999999996) [terminated. If we hover over the dummy in](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=282.861) [the lower part, we can see that it was](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=285.34400000000016) [indeed successful, and that, in turn,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=287.78750000000014) [triggered the last step because it had a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=290.27500000000003) [trigger condition of one\_succeeded. If we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=293.78499999999997) [similarly hover over the top part, we can](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=296.055) [see those stages were both skipped.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=298.99750000000006) [Neither of those tasks was ever executed.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=301.255) [And this example shows us why](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=304.245) [DummyOperators are sometimes required. As](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=306.275) [we've discussed previously, we should](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=309.53) [never leave an empty path coming out of a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=311.1621428571429) [branch, and that is exactly where dummy](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=314.265) [tasks come into play. In this example, had](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=316.5607142857143) [we not included the DummyOperator, the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=320.03499999999997) [bye\_bash operator would simply have been](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=322.61125000000004) [skipped. Notice in the Gantt chart how the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=324.8687500000002) [two states corresponding to the upper part](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=327.5861111111111) [have both been skipped. Let's check out](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=329.93277777777786) [what a run of the upper part would look](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=331.887) [like. So let's go back to the DAG, and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=333.901) [using that little play button over on the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=336.6086363636364) [extreme right, we will trigger the DAG's](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=339.51772727272737) [execution again. This time, we are](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=342.3807142857144)[prompted for whether we would like to run](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=343.85785714285714) [this again. We say we do, and then we see](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=345.73214285714295) [the second run. We click into our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=349.1968181818183) [BranchOperator to see which of the two](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=351.893) [branches was hit this time around, and we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=353.97499999999985) [find that our random number generator has](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=356.3619999999999) [changed its mind, and this time we do](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=358.985)[indeed get into the upper part. So the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=362.08409090909095) [highlight passes from the branching state](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=365) [into the hello\_spikey state, which is over](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=367.235) [in the top part, and then the rest of the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=369.5861111111111) [DAG execution goes through as usual, and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=373.05249999999995) [the two parts converge in the final state](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=375.66499999999996) [bye\_bash. We can now verify this by](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=378.8649999999998) [hovering over the dummy in the lower part,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=381.4925000000002) [and we see that its state shows up as](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=383.57500000000016) [skipped. If we hover over the states in](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=386.0192857142856) [the top part, we can see that each of them](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=388.36600000000004) [has the State of success. So this time,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=391.0358333333333) [the random number generator inside our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=393.5664285714285) [branch generated a different value, and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=396.1007142857143) [that, in turn, triggered a different path](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=398.55642857142857) [for the graph execution. We can also see](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=400.705) [this from the Gantt view. Here, we have](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=403.61611111111114) [just the one skipped state, which](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=406.3762499999999)[corresponds to the dummy from the lower](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=408.57944444444445) [part. We have successfully demonstrated](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=410.92055555555555) [the use of dummy states and the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=412.5949999999999) [BranchPythonOperator to implement](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=415.78999999999996) [branching and conditionals in our Composer pipelines.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=9&mode=live&start=417.47100000000006)

[Summary](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=10&mode=live)

[We've now come to the end of this module.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=10&mode=live&start=1.537) [This module was full of demos. Along the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=10&mode=live&start=3.547) [way, we saw how we can create DAGs by](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=10&mode=live&start=5.944999999999999) [writing simple Python code and copying](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=10&mode=live&start=7.992) [them into the DAGs folder of our Composer](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=10&mode=live&start=10.242) [environment. We then demonstrated the use](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=10&mode=live&start=14.939499999999999) [of different trigger rules, such as](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=10&mode=live&start=17.240333333333332) [all\_success, all\_done, one\_failed, and so](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=10&mode=live&start=19.837) [on. We then turned our attention to using](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=10&mode=live&start=22.962) [some of the important fundamental](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=10&mode=live&start=25.577) [operators in Composer and Airflow,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=10&mode=live&start=27.26866666666666) [starting with the BashOperator, which is a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=10&mode=live&start=29.581999999999994) [way to implement arbitrary shell scripts.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=10&mode=live&start=32.567) [These will be executed on an image of a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=10&mode=live&start=34.587) [Debian Docker container running somewhere](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=10&mode=live&start=38.65336363636365) [on the Kubernetes cluster. Next, we spoke](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=10&mode=live&start=41.27128571428571) [about the PythonOperator, which is a way](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=10&mode=live&start=44.562000000000005) [to execute arbitrary Python callbacks.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=10&mode=live&start=47.35811111111112) [This could include any Python code of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=10&mode=live&start=49.597) [pretty much any library. Once again, this](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=10&mode=live&start=52.183) [is going to be executed inside a Python](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=10&mode=live&start=54.931999999999995) [runtime, which is going to be in a Docker](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=10&mode=live&start=56.917) [container sitting on the Kubernetes](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=10&mode=live&start=60.55700000000001) [cluster. We saw how the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=10&mode=live&start=62.257000000000026) [BranchPythonOperator can be used in order](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=10&mode=live&start=64.21300000000001) [to introduce conditionals within our DAG,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=10&mode=live&start=66.04557142857146) [and we also noted the use of the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=10&mode=live&start=68.85128571428571) [DummyOperator. This operator does nothing](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=10&mode=live&start=72.23533333333334) [at all, but it has some important uses if you would like to implement branching.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=ef9f8099-c78c-4fa9-bf2b-baa5deae931d&clip=10&mode=live&start=73.91033333333331)

[Managing and Monitoring Workflows](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=0&mode=live)

[Module Overview](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=0&mode=live)

[Welcome to this module which is all about](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=0&mode=live&start=0) [managing and monitoring workflows. In this](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=0&mode=live&start=3) [module, we turn our attention to more](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=0&mode=live&start=5.715000000000001) [complex pipelines and use the many](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=0&mode=live&start=7.946666666666666) [integrations of Airflow with the GCP. We](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=0&mode=live&start=10.606666666666667) [begin by understanding how Airflow and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=0&mode=live&start=13.566666666666666) [environment variables differ. Both of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=0&mode=live&start=16.5175) [these are effectively forms of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=0&mode=live&start=18.825000000000003) [parameterization that can be used to alter](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=0&mode=live&start=20.71250000000001) [our pipelines. It will make use of Airflow](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=0&mode=live&start=23.332500000000007) [variables in order to copy files from one](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=0&mode=live&start=25.785714285714292)[GCS bucket into another. This also](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=0&mode=live&start=29.219999999999995) [demonstrates the use of the GCS operators](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=0&mode=live&start=31.444) [in Airflow. We then make use of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=0&mode=live&start=34.05333333333333) [environment variables to configure](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=0&mode=live&start=36.47571428571427)[SendGrid. This is an email platform.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=0&mode=live&start=38.349999999999994) [Airflow has an email operator which works](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=0&mode=live&start=41) [with SendGrid. Next, we move into a series](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=0&mode=live&start=44.15000000000002) [of the GCP interconnections. We use SQL](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=0&mode=live&start=47.444) [queries and perform CRUD operations using](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=0&mode=live&start=50.15375) [the BigQuery operators, as well as the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=0&mode=live&start=52.43857142857143) [Dataproc integrations to run Hadoop MapReduce jobs.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=0&mode=live&start=56.01)

[Use Airflow Variables to Copy Files from One GCS Bucket to Another](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live)

[In this example, we will demonstrate the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=0.519) [use of Airflow variables while copying a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=2.9423333333333335) [file from one GCS bucket location to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=6.0456666666666665) [another. Please note that these are](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=9.068999999999999) [Airflow variables and not environment](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=10.927571428571433) [variables. Airflow variables are going to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=12.983999999999998) [be available to the code running within](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=14.92185714285714) [our Airflow DAGs. We will return to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=17.367750000000004) [setting environment variables in a future](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=19.329000000000004) [demo. Let's get started in the Storage](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=21.980666666666668) [browser. We are going to first create a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=24.24328571428572) [bucket location in which to upload some](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=26.10233333333333) [files. So we click on the CREATE BUCKET up](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=28.98233333333334) [top and then give a bucket name. Let's](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=31.282333333333334) [call this the spikey\_catalog\_image\_bucket.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=34.307) [We can change the bucket type to be](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=37.459) [Regional. And other than that, we are fine](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=39.29899999999998) [with the defaults, so we can go ahead and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=40.93600000000001) [create this bucket. Next, we are going to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=43.485666666666674) [upload a bunch of files. These are image](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=45.48900000000002) [files from pexels.com. If you have not](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=48.028999999999996) [heard of Pexels, it's a great source of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=50.64185714285715) [free stock photographs shared by](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=53.33775000000001) [photographers. These are free for](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=55.159000000000006) [commercial use and without attribution.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=57.414) [We've collected a few of these images. Let](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=59.489) [me go ahead and upload them to this Google](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=61.761857142857146) [Cloud Storage bucket. So we now have all](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=64.48400000000001) [of these files in the source bucket. Let's](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=66.76733333333333) [go ahead and create another bucket, this](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=68.81471428571429) [one for the destination. Let's go ahead](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=70.931) [and call this the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=73.499)[spikey\_catalog\_image\_bucket\_backup. Once](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=75.489) [again, it's a Regional bucket. We are now](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=77.01233333333334) [ready to write the code to move these](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=80.2215) [files from source to destination. So let's](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=82.59899999999999) [switch into our favorite Python editor,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=85.244) [and this file is called gcs\_to\_gcs.py. It](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=87.479) [begins in the familiar fashion with some](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=91.82066666666667) [import statements of the datetime and the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=94.091) [Airflow. We then set up the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=96.23299999999998) [default\_dag\_args. Here we do something a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=99.03066666666668) [little different. This time we explicitly](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=101.6432857142857)[create a fixed start\_date. Note, by the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=104.01899999999998) [way, that the docs recommend that we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=106.29150000000001) [always use a fixed start\_date like this](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=108.13300000000001) [one and not make use of a dynamic date](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=110.24700000000006) [like datetime.now. We also specify the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=114.525) [number of retries to be 1, the retry\_delay](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=116.719) [to be 2 minutes, and finally, we pass in a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=119.499) [project\_id variable. And the most](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=123.76149999999996) [interesting bit is how we access it from](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=125.41099999999999) [that models.Variable .get. And in fact,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=128.219) [there's more of that in very next line. We](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=131.29263636363638) [use that to get the locations of our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=133.77185714285716) [source and destination bucket. All of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=136.15566666666666) [these three are Airflow variables, which](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=138.37185714285715) [we will have to explicitly set while](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=140.84445454545457)[invoking our DAG. We'll see how to do that](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=143.40263636363645) [in just a moment. Gcs\_source\_bucket and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=146.28099999999998) [gcs\_dest\_bucket are now both defined as](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=149.50233333333335) [globals. Next up, we'll define our DAG. As](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=153.01066666666668) [usual, this needs to be in the global](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=156.798) [namespace. This time we have omitted a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=159.19000000000005) [scheduling interval. When we have a single](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=161.77649999999997)[operator, this is a BashOperator, and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=165.009) [within the body of this BashOperator, we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=167.7704285714286) [simply make use of the gsutil command. So](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=170.014) [we construct a bash\_command using the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=173.875) [gsutil cp -r syntax, and we then splice in](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=176.80233333333337) [the values of the source and the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=180.50400000000002) [destination bucket. While setting these](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=182.50900000000001) [Airflow variables, we'll have to make sure](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=184.11100000000002) [that they are valid GS locations. And that](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=185.539) [really is it. Our DAG has just the one](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=189.321) [operator, and so we are done with coding](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=192.2275714285715) [of our Python. The next order of business](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=194.62599999999992) [is to actually define the Airflow](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=196.7665) [variables. So we switch into a Cloud Shell](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=199.009) [window, and there we make use of this](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=202.10775) [syntax, gcloud composer environments run,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=204.27274999999997) [followed by the name of our environment,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=207.539) [followed by the variables keyword, and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=210.519)[finally, the set switch followed by a key](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=213.799) [and a value. And we can see from the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=216.51900000000003) [return value that under the hood this is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=219.024) [invoking the kubeconfig utility, which is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=221.04149999999998) [used to create a state within our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=223.3134444444444) [Kubernetes cluster. Now this command,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=226.50900000000001) [unfortunately, needs to be run once for](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=228.49900000000002) [each Airflow variable which we wish to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=230.83677777777777) [set. And that's why we've got to run it](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=233.20122222222219) [yet again with the gcs\_source\_bucket, and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=235.459) [the value has to be a valid gs path. And](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=238.782) [once this runs through, we've got to run](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=241.712) [it a third time for the gcs\_dest\_bucket,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=243.336) [once again with a valid GCS location. At](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=247.459) [this point, we have successfully passed in](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=250.84733333333332) [the three Airflow variables which are](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=253.48566666666667) [referenced by our code. We can now switch](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=256.169) [back into the console, click into the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=259.0139999999999)[bucket for our Kubernetes environment,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=261.61899999999997) [click into the dags subfolder, and there,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=263.519) [as usual, we can go ahead and upload the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=266.13699999999994) [Python source for the DAG we wish to run.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=268.927) [As always, Airflow is going to pick up](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=272.509) [that we've uploaded a new Python file. It](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=274.529) [will notice that there is a DAG in the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=276.959) [global namespace, and it will add the DAG](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=280.6490000000002) [into its DAG bag. These steps occur](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=283.287) [exactly as usual. If we switch now into](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=285.51899999999995) [the Airflow webserver and click on DAGs,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=288.389) [we can see our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=290.64185714285713) [transferring\_data\_from\_gcs\_to\_gcs show up](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=292.305) [there. Now remember that this time around](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=294.72299999999996) [we had not actually specified a start](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=297.479) [date, and so we are going to have to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=300.104) [manually trigger this DAG. We do so by](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=302.49899999999997) [clicking on the Trigger Dag button on the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=304.693) [extreme right. We are prompted for a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=306.99899999999997) [confirmation. Once we hit Yes, our DAG is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=309.2039999999999) [going to change into the running state.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=311.61099999999993) [Let's click through and take a look at how](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=314.489) [our tasks are doing. As always, we can](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=316.877) [switch from the tree view into the graph](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=319.40677777777773) [view. This DAG has just the one task](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=322.044) [within it, and if we hover over it, we can](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=324.86677777777777) [see that it's running, and momentarily](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=327.2623333333331) [that task succeeds. Let's see how long it](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=329.9915) [took to run by clicking on the Gantt](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=332.73650000000004) [chart. We can see that it took about 9](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=335.17066666666676) [minutes in total, which is really quite](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=338.1578888888889) [long. Pipelines in any case are inherently](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=340.23757142857147) [batch oriented, and there's a lot of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=342.549) [overhead associated with setup, which will](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=345.174) [be amortized if you had a real](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=347.6704285714285) [long-running pipeline. In any case, let's](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=350.6547142857144) [now browse into the variables by clicking](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=352.837888888889)[on the Admin tab up top. And when we click](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=355.25649999999996) [through, we can see that there are the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=358.23809090909094) [three key-value pairs that we just set.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=359.85775) [There's the gcp\_project, the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=362.509) [gcs\_dest\_bucket, and the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=365.70900000000006) [gcs\_source\_bucket. Notice also that there](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=367.8556666666667) [are little icons over on the left which](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=369.96172727272733) [will allow us to edit or delete these, and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=372.6978888888889) [there's also a button up top to import a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=374.8578888888889) [large number of Airflow variables.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=377.8323333333333) [Finally, let's switch back into the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=379.549) [Storage browser and make sure our copy](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=381.769) [operation was successful. Let's click into](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=384.40274999999986) [the destination bucket, and there we do](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=387.014) [indeed find that all of the photographs have been copied over successfully.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=1&mode=live&start=389.6204285714286)

[Delete DAGs and Composer Environment](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live)

[In this demo, we will learn how to clean](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=0.77) [up after ourselves. We will learn how to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=3.0500000000000007) [delete individual DAGs, as well as a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=5.653750000000001) [Composer environment. We begin by deleting](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=8.139999999999999) [the individual DAGs that we had within our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=10.527142857142858) [environment. The command for this is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=13.491666666666665) [gcloud composer environments storage dags](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=15.75)[delete. In case you're wondering why the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=19.15) [keyword storage appears there, that's](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=22.04249999999999) [because when we delete this DAG, the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=24.116666666666664) [underlying Python file is going to be](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=27.118333333333332) [deleted from the storage bucket. We also](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=29.345714285714283) [have to specify the environment, as well](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=31.37857142857143) [as the location, and finally, the name of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=33.64857142857143) [the Python file which contained the DAG.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=36.676) [We get a message telling us that all of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=38.79) [the contents of this file are being](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=41.22818181818184) [recursively deleted from the dags](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=43.24857142857142)[subdirectory. We are prompted for whether](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=46.0225) [we would wish to continue. And once we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=47.77499999999999) [give our confirmation, the DAG is gone. If](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=49.99999999999999) [we switch to the Storage browser, click on](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=53.089999999999996) [the bucket for our environment and click](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=55.68428571428571) [into the dags folder, we will find that](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=58.48) [this gcs\_to\_gcs.py file has disappeared.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=62.022222222222226)[There is one DAG that still exists in this](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=64.8) [location. Let's delete that one as well.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=67.49100000000006) [This one is titled python\_bash\_dummy.py.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=69.79) [So we switch back and reinvoke the gcloud](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=72.79) [composer environments storage dags delete](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=75.52714285714285) [command, this time specifying](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=79.06285714285713) [python\_bash\_dummy as the file we would](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=81.32249999999999) [wish to delete. Once again, we are greeted](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=83.67750000000004) [by the same warning message. We give our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=86.27999999999999) [confirmation, and once this command runs](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=88.54874999999998) [through, if we switch back into the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=90.222) [Storage browser, we can see that that file](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=92.96599999999997) [has vanished as well. The dags folder is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=94.96800000000002) [now completely empty. Next, let's see how](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=97.52857142857144) [we can list and delete our environments.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=100.28363636363636) [The command to run to list our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=102.81) [environments is gcloud beta composer](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=105.09666666666668) [environments list. Notice that we have to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=107.58599999999998)[specify the location, which here is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=110.07874999999999) [us-central1. We have just the one](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=113.07500000000002) [environment in existence. This is the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=115.65750000000003) [spikey-test-environment, and it's in STATE](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=118.27499999999999)[RUNNING. Now this environment is really a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=120.412) [Kubernetes cluster, and Kubernetes](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=123.07) [clusters and their associated VM instances](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=124.80250000000001) [are not cheap resources, so let's go ahead](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=127.75) [and delete this environment. The command](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=130.32500000000002) [that we run is gcloud composer](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=132.46666666666664) [environments delete. Once we confirm that](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=135.27999999999997) [we actually want to delete this](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=137.70666666666665) [environment, that is going to put an end](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=139.13400000000001) [to the Kubernetes cluster, as well as the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=141.4860000000001) [underlying VM nodes. We can confirm that](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=145.27299999999997) [this is the case by using the Navigation](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=147.29999999999998) [menu. We navigate to Kubernetes Engine,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=150.17399999999995) [and there we find that our cluster indeed](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=152.76) [no longer appears. Similarly, if we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=155.69090909090914) [navigate to the Compute Engine, VM](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=157.55499999999998) [instances section, we find that the nodes](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=159.32000000000002) [which comprise a cluster have gone as](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=162.75) [well. However, this is an important](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=165.375) [caveat. Deleting an environment does not](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=167.48333333333332) [delete its underlying storage bucket. So](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=170.2966666666667) [if we now go to the Storage browser, we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=173.02333333333334) [see that the bucket still exists. We can](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=175.1) [navigate into the logs directory and click](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=177.68571428571428) [through and find there data about all of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=180.37714285714287) [the operations we have performed in this](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=182.9225) [test environment. And now if we switch](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=185.29500000000002) [back into Cloud Shell, we can drill down](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=187.48555555555558) [into the logs and all of the other state](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=189.94714285714286) [information which existed when our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=192.5314285714286) [Composer environment was still up and running.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=2&mode=live&start=194.82)

[Use the Send Grid Email Integration in Airflow](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live)

[In this example, we will sign up for the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=0.902) [SendGrid email messaging service on the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=2.638666666666667) [Google Cloud Platform, and we will also](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=4.776000000000001) [integrate with the Apache Airflow SendGrid](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=7.520000000000003) [module. We get started by searching for](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=10.470333333333333) [the Marketplace menu item in the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=13.217000000000002) [Navigation menu, and in the search bar](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=15.315333333333331) [which appears, we search for SendGrid](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=17.406285714285715) [Email API. We get a couple of options. The](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=19.972) [first of these is the email API. The](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=23.18575) [second has to do marketing campaigns.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=25.38342857142857) [Let's just pick the first. We click](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=27.912) [through and START WITH THE FREE PLAN. It's](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=29.638666666666666) [always a good place to start. This allows](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=32.25628571428572) [us to send a large number of emails, 12,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=34.56) [000 each month, without incurring any fee.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=37.44575) [So we hit Subscribe. We then need to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=40.902) [register with SendGrid. But we also notice](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=43.10628571428572) [in the various notifications over on the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=45.477) [top right that SendGrid has eight](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=47.834857142857146) [integrations with the Google Cloud](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=49.961999999999996) [Platform. And the billing for SendGrid](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=52.43699999999998) [happens right through the GCP. In any](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=54.57366666666667) [case, let's now continue with the setup](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=57.70399999999999) [process. So we click on the Register with](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=60.51099999999997) [SendGrid button. Here we are prompted for](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=62.50644444444447) [a username and a password. We've to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=64.95199999999998) [confirm the password and supply an email](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=67.74) [ID. We try and hit Continue, but we are](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=70.533) [told that our username already exists. We](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=72.95533333333334) [just go ahead and tweak it by adding an](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=75.09057142857142) [underscore in there. We now are able to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=77.44699999999999) [proceed successfully. Because of the GCP](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=81.04771428571428) [integration, we will have to choose an](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=82.907) [account and sign in. We do exactly that.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=84.79057142857144) [SendGrid is going to need to access our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=86.962) [Google account. This is an important](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=89.38599999999998) [intermediate step. We should make sure](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=91.96533333333335) [that we are actually fine doing this. The](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=94.04290909090906) [fine print is worth reading. There's a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=96.27866666666667) [link there if you would like to understand](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=98.1745) [the risks in more detail. In any case, for](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=99.81057142857144) [the purposes of our demo here, we are](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=102.74) [totally fine to move on. So at this point,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=104.52914285714286) [we've successfully created our SendGrid](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=107.272) [account. We can see the details of our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=109.45200000000001) [account and the subscription plan. We see](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=111.712) [that it's linked to the CloudUser Billing](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=114.54799999999999) [account. A billing account must be](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=116.66899999999997) [associated with a payment instrument and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=118.40057142857145) [can be used to pay for multiple GCP](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=120.11485714285716) [projects and services. In any case, we hit](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=123.44700000000002) [CLOSE and now get to important part. In](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=126.59033333333332) [order to get started with the SendGrid](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=129.21200000000002)[email API, we are going to need an API](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=131.3120000000001) [key, and that API key is going to require](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=133.68824999999998) [us to go to the SendGrid site. As an](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=135.72866666666664) [aside, there is an alternative to API](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=139.21057142857143) [keys, and that is using the SendGrid](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=140.6331111111111) [username and password, but that's not](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=142.912) [recommended. So we keep going and are](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=145.54342857142862) [asked to confirm our email ID. We switch](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=147.96700000000007) [into our email inbox, and there is an](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=150.622) [email there from SendGrid, which we need](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=152.97699999999998) [to confirm. So we click on the big blue](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=155.192) [Confirm Email Address button, and that's](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=159.12290909090902) [enough for us to be up and running. We now](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=161.328) [switch back into the SendGrid website.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=163.972) [There we can see that there is a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=166.912) [dashboard, and this has over on the bottom](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=168.72533333333328) [left a Settings section, and there you've](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=170.73699999999997) [got to click on the link for API Keys.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=172.99200000000005) [This allows us to get started creating an](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=176.982) [API key by clicking on the big blue button](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=180.15799999999993) [on the top right. Here we can specify API](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=182.88018181818185) [key permissions, such as Full Access,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=186.11057142857146)[Restricted Access, and so on. Let's also](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=188.75311111111114) [give this API key a name. We call](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=191.492) [spikey\_product\_notify key. Let's go with](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=194.972) [Full Access for now, and go ahead and hit](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=197.80914285714283) [Create & View. This displays our API key.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=200.8145) [This is a string which we need to copy. As](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=203.952) [the message there tells us, for security](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=207.12533333333334) [reasons, it's not going to be displayed](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=208.4895) [again from within SendGrid, but we'll need](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=210.572) [to assign it to a Composer environment](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=213.382) [variable, so be sure to copy it. Once](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=215.45799999999997) [that's done, we click on the Done button](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=219.23755555555553) [and switch back from SendGrid into the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=221.922) [Google Cloud Platform. Now, at end of our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=224.172) [last example, we had cleared up our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=227.3705714285714) [Composer environment, so we've got to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=230.07057142857147) [start by creating a new one. This time](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=232.11800000000002) [we'll do so from the command line. So from](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=234.35644444444446)[a Cloud Shell window, we run the command](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=236.51399999999998) [gcloud beta composer environments create,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=238.922) [followed by the name, location, zone, and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=241.972) [Python version for this environment. It](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=245.47866666666667) [takes a while for this environment to be](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=248.257) [created because remember it's provisioning](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=250.61700000000013) [a GKE cluster and the associated VM](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=251.972)[instances. If we now switch back into the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=256.2945) [web console, we can see that this](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=258.5064444444443) [spikey-composer-environment has come into](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=261.437) [existence. Now, of course, Composer runs](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=263.432) [Apache Airflow, and Airflow has a SendGrid](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=266.0534285714285) [module. That module merely needs a couple](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=268.62700000000007) [of environment variables to be configured,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=270.97866666666664) [and we can then go ahead and send emails](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=272.8348571428572) [from within our DAGs. So let's go ahead](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=276.183111111111) [and set those to environment variables,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=279.15599999999995) [one each from the web console and the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=280.962) [command line. So we are in the ENVIRONMENT](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=283.37800000000016) [VARIABLES section, we click on the EDIT](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=286.1720000000001) [button, and we type in the first](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=287.81033333333335) [environment variable. This is the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=290.9394999999999) [SENDGRID\_API\_KEY, that's the environment](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=293.452) [variable name, and the value is what we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=295.16799999999995) [just copied. We hit SUBMIT, and this](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=298.177) [successfully adds one environment](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=300.60366666666675) [variable. Let's set the other using](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=303.16200000000003) [gcloud. So we go back to Cloud Shell, and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=304.802) [there we run the gcloud composer](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=307.57755555555565) [environments update command. But this](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=310.4145) [time, notice how we use a different](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=312.52) [switch. This is the update-env-variables](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=314.61299999999983) [command. This is different from the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=317.35200000000003) [command we used while setting the Airflow](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=319.212) [variables in a previous example. This](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=321.7442222222221) [environment variable name is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=324.63533333333334)[SENDGRID\_MAIL\_FROM, and the value is the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=327.28866666666676) [email ID from which the emails are going](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=329.59644444444456) [to go out. We go ahead and run this](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=332.06057142857134) [command and then switch back to the web](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=333.8134285714285) [console, and there in the Environment](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=336.552) [details section, the other environment](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=338.38628571428575) [variable has appeared as well. We have now](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=340.4532499999999)[done all of the setup required to make use of SendGrid from within our DAGs.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=3&mode=live&start=343.3195)

[Complex Pipeline Integrating BigQuery, Cloud Storage, and Send Grid](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live)

[We will now wrap up this course with a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=0.587) [fairly complex example. We will create a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=2.7990000000000004) [pipeline which will run a query to fetch](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=5.389000000000001) [data from BigQuery. It will export that](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=7.800999999999999) [data into GCS, send out an email](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=11.284142857142857) [notification with the data, and then clean](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=14.077000000000002) [up a temporary table that it had created](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=16.432714285714287) [in BigQuery. Let's start off in BigQuery](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=18.947) [by setting up some of the data that we are](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=21.470749999999995) [going to need. We have here a project.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=23.997999999999998) [That's spikey-gcp over on the left. Let's](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=26.557)[create a new dataset by clicking on that](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=28.887) [button on the lower right. Let's give this](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=31.472714285714286) [dataset the name spikey\_composer\_dataset](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=35.2927142857143) [and locate the data in the United States.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=37.567) [We are fine to go with the other defaults,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=40.627) [so let's go ahead and create this dataset.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=43.557) [The dataset is merely a container. Let's](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=45.607)[now go ahead and add some tables inside](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=47.777) [this dataset. So we click on the CREATE](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=50.391000000000005) [TABLE button. That takes us to our dialog](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=53.119499999999995) [where we can create an empty table in the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=55.567) [current project. Let's name this table](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=58.062454545454514) [spikey\_products\_table. We then have to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=61.761) [specify the schema by adding fields. These](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=63.763000000000005) [are column names, types, and whether](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=65.995) [they're nullable or required. So we go](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=68.60366666666665) [through with the process, and by the end](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=71.00700000000002) [we have a table which has a product\_id, a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=72.59200000000001) [product\_name, price, and whether it's on](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=75.74128571428572) [sale or not. It's actually the last column](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=77.76700000000002) [here that we are particularly interested](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=80.27866666666667) [in. This is a Boolean column which we are](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=82.26533333333332) [going to field around. In any case, let's](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=85.567) [go ahead and create this table. At this](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=87.811) [point, the table is empty, so we've got to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=90.45700000000001) [go ahead and insert some data into the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=93.36900000000001) [table with this simple INSERT statement.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=95.3395) [This inserts three rows of data, of which](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=97.597) [two have the last column, that's the sale](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=101.12985714285713) [column, set to True. We run the query, and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=103.85557142857142) [then in the preview pane we can see that](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=106.57199999999999) [the three rows have been inserted](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=108.7112857142857)[successfully. Next, let's click on that](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=111.047) [COMPOSE NEW QUERY button on the top right](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=112.69700000000002) [and use this to put together a simple](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=114.817) [query for those products that are](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=117.59366666666666) [currently on sale. We hit Run, and we can](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=119.97899999999998) [see that there are exactly two such](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=121.83299999999997) [products right now. This is the exact](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=124.11200000000002) [query that we would like to run in](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=126.56700000000002) [Composer, so we can now switch into our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=128.37099999999998) [favorite Python editor. We pick up the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=130.783) [name of the BigQuery dataset from an](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=133.45811111111115)[Airflow variable. We then go ahead and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=135.592) [construct the name of our table by tacking](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=137.95518181818184) [on a .temp\_sale\_table over at the end. And](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=140.48588888888892) [finally, we construct an output\_file by](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=144.09366666666668) [looking at a gcs\_bucket variable and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=147.07533333333333) [tacking on the timestamp. We are also](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=149.975) [going to send an email notification with](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=152.59033333333335) [all of the products on sale, so we also](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=154.84414285714286) [read in from an Airflow variable the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=157.24699999999999) [email\_id to which to send that](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=158.98325) [notification. Then we construct the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=161.24075)[default\_dag\_args. Notice here we specify](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=164.01699999999997) [the start\_date, email, and whether we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=166.57700000000003) [would like to send email\_on\_failure and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=168.8836666666667) [on\_retry. We will pass these into the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=172.01899999999998) [SendGrid operator. Then it's time to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=175.58450000000005) [instantiate our DAG, and within the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=177.73271428571434) [context manager, to instantiate the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=179.79499999999996) [operators. The first operator is a new](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=182.10949999999997) [one. This is another GCP-specific one.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=184.3398571428572) [This is a BigQuery operator. What's more,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=187.607) [this is going to run a query and save the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=191.25144444444442) [results of the query into a destination](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=194.67336363636366) [table. And finally, we also have to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=197.23154545454554) [specify a write\_disposition, so it's going](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=199.61033333333327) [to truncate that table if it happens to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=201.46985714285714)[already exist. The next operation in our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=204.5736666666667) [pipeline is going to be to export data](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=206.59199999999996) [from that particular temporary table into](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=209.13075) [the GCS location we had defined up above.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=212.07366666666667) [And for this, we have yet another](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=215.567) [operator, BigQueryToCloudStorage. We can](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=217.35199999999998) [see that there are really a host of handy](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=221.00144444444445)[operators in Airflow. The next item is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=223.38500000000002) [sending out the email notification. Notice](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=226.39588888888892) [how we do so using a trigger\_rule of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=229.006) [ALL\_SUCCESS. So the email is only get sent](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=232.198) [out if the data was successfully exported](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=234.35575) [to GCS. And finally, we use the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=237.62199999999999) [BigQueryTableDeleteOperator to get rid of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=241.90200000000002) [the temporary table which we had created](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=243.65154545454547) [while running our query. And that does it](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=245.567) [for the pipeline. We then simply specify](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=247.757) [the dependencies. So we first run the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=250.5636666666667) [query, then export into the temporary](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=253.44074999999998) [table from which we save it to GCS. If](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=255.66790909090912) [it's all successful so far, we send out](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=258.9053333333333) [the email notification, and finally, we delete our temporary BigQuery table.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=4&mode=live&start=261.56699999999995)

[Writing DAG to Work with Big Query, GCS, and Send Grid](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live)

[We are done coding up our pipeline. Let's](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=0.471) [go ahead and give it a spin. Let's start](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=2.68225) [by creating a bucket to hold the GCS](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=5.17190909090909) [exports. Let's call this bucket](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=8.095545454545453) [spikey\_products\_on\_sale\_bucket. We can](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=11.644999999999998) [specify a Regional bucket, and we host it](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=13.107666666666669) [in us-central1. And then go ahead and hit](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=15.801) [Create. Next, let's switch back to Cloud](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=18.992428571428576) [Shell and update all of the Airflow](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=21.133857142857146) [variables that we used in our code. The](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=23.18671428571428) [first of these was the GCP project, which](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=25.94009090909091) [is spikey-gcp. We then have to run the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=29.532818181818183) [command again, once for each Airflow](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=31.915999999999993) [variable. So we have the bq\_dataset\_name](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=34.02699999999999) [that's spikey\_composer\_dataset, the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=36.451) [bq\_table\_id. This is a table within that](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=39.88211111111111) [dataset. Next up is the gcs\_bucket where](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=43.03988888888888) [we have to save the outputs, followed by](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=46.45099999999999) [the email ID to whom the notification](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=49.98528571428571) [needs to be sent. This is a user named](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=52.09433333333333) [Alice. Now that we've set all of these](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=55.92433333333335) [Airflow variables, we can switch back into](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=57.99988888888891) [the Cloud Storage browser and browse into](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=60.13433333333333) [the dags folder and upload our DAG file.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=62.84736363636363) [As usual, this DAG file is going to be](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=66.491)[picked up by Airflow. It will notice that](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=69.431) [it has a Python file which has a DAG](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=71.79211111111113) [object in the global namespace. It will](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=74.77322222222223) [then parse this and instantiate the DAG](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=77.12211111111111) [and schedule it for execution. To view](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=79.471) [this, let's open up the Airflow webserver.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=83.07988888888889) [We can do so by clicking on the link in](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=85.421) [the environment details. By this point, we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=88.191) [are very familiar with this UI, so we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=91.22300000000001) [click through into the details, we switch](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=93.02385714285714) [from the tree view to the graph view just](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=95.08500000000001)[because that's a lot more intuitive, and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=97.92528571428572) [there we see that our pipeline is running.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=100.80433333333333) [We can see that it's currently running the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=103.471) [BigQuery operation to create the temporary](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=105.961) [table. So let's check on it by changing](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=108.961) [tabs. So we click into BigQuery. There,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=111.23724999999997) [within our dataset, we can find that there](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=113.90957142857143) [is a new table which appears. That is the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=116.9385) [temp\_sale\_table. Let's click on it, and in](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=120.72600000000001) [the preview field, we can see that there](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=122.81099999999998) [are a couple of rows in there. These](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=124.72683333333333) [correspond to the two products which had](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=126.79933333333334) [the sale column set to True. We can now](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=129.1885) [switch back into Airflow, and if we check](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=132.30528571428576) [on the health of our DAG, we can see that](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=134.27499999999998) [things have moved along. So the export to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=136.481) [GCS has already succeeded, and we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=138.976) [currently are on the email\_notification](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=141.4635)[step. It takes a while for this step to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=143.94475000000003) [run through to completion, but eventually](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=146.441) [that happens as well. And finally, the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=148.121) [deletion of the temporary BigQuery table](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=150.82099999999997) [turns green because it's currently](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=153.501) [running, and in just a moment after that,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=155.97600000000003) [the whole pipeline is marked as a success.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=158.431) [Let's click on the Gantt view, and we can](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=161.431) [see there that this entire pipeline took](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=163.45766666666665) [just about a minute to execute. So all of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=165.7052857142857) [these steps were scheduled and run really](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=168.55100000000004) [quickly. Let's click on the Admin menu and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=171.07100000000014) [select the Variables field. We can see](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=173.827) [here that all of the Airflow variables](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=176.34199999999998) [which we set have been successfully](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=178.421) [reflected. And if we now return into](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=181.00100000000003) [BigQuery, we find that the table which we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=183.18814285714288) [were viewing a moment ago has disappeared.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=185.021) [Our dataset no longer has a table called](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=187.471) [temp\_sale\_table. On the other hand, if we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=191.0532222222223) [check in the Storage browser, there we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=193.63918181818175) [will indeed find that in the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=196.09433333333334)[spikey\_products\_on\_sale bucket a file. A](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=198.441) [CSV file has been written out. We can](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=200.72957142857143) [download the CSV file and open it in a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=202.90988888888887) [spreadsheet program, and this contains](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=205.33242857142858) [information about all of the products on](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=207.461) [sale. One last bit we're checking on.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=210.06850000000003) [Let's switch into our Inbox, and there we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=212.421) [see our email notification has](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=213.93372727272725) [successfully come through as well. Let's](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=215.3552857142857) [round out the demo by heading back into](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=217.792) [BigQuery and inserting a new row into our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=220.1999999999999) [data. Let's go ahead and add a new product](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=223.95725000000004) [which is on sale. So this is another](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=226.451) [INSERT INTO command, and this time we are](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=229.58814285714283) [listing a New Years Eve Party Decoration](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=231.8346363636364) [Balloon Kit and is indeed on sale. Let's](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=233.96475) [run this query, then switch into the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=237.82) [preview plane in order to ensure that the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=240.613) [insertion was successful. Once that's](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=243.45766666666663) [done, we can go back into Airflow, into](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=245.14322222222222) [the DAGs section, and trigger another run](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=247.82827272727275) [of our DAG. As usual, we do so by clicking](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=250.3991818181819) [on the Trigger Dag button on the right. We](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=253.21600000000004) [confirm that we would indeed like to rerun](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=256.73463636363635) [the DAG, then head back into our favorite](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=258.9237272727271) [graph view. Fairly soon, the query step](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=261.706) [goes through successfully, the highlight](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=264.93850000000003) [passes onto the export into GCS, and then](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=267.4335) [it continues the email notification, goes](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=271.1165555555555) [through, and finally, the deletion is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=273.14322222222216) [successful as well. Let's head back into](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=275.36225000000013) [the Storage browser and check on the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=278.1595714285713) [results of this pipeline. And we click](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=280.45099999999996) [into our bucket. We see that there is a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=282.45099999999996) [new output there. We know that from the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=284.7576666666666) [new timestamp. Let's download that file](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=286.85242857142856)[and open it. And when we do so, we see](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=288.60385714285707) [that there are indeed three rows now. The](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=291.1972499999998) [new row with our New Years Eve Decoration](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=293.80544444444445) [Balloon Kit does indeed show up. So our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=296.481) [pipeline really is working as we intended it to.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=5&mode=live&start=301.461)

[Use Cloud Dataproc Operators in Composer](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live)

[In this example, we will demonstrate the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=0.632) [use of the Cloud Dataproc operators to run](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=2.137714285714286) [Hadoop jobs from Google Cloud Composer.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=5.677) [The most logical place to pick up the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=8.632) [action is with the context manager where](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=10.279999999999996) [we define our models.DAG object. As](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=12.37533333333333) [always, we have to do this in the global](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=15.942)[namespace so that Airflow will add it to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=18.371999999999996) [the DAG bag. Where it gets really](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=20.742000000000004) [interesting though is in the line right](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=22.355333333333338) [below. Here we have an operator which is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=25.136999999999997) [of type](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=27.99422222222222) [dataproc\_operator.DataprocClusterCreateOperator.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=28.672) [So we can see that there are special](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=33.652) [integrations between in Airflow and the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=35.483111111111114)[GCP. This operator takes in a task\_id, a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=38.97866666666668) [cluster\_name, the number of workers, zone,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=42.3095) [master\_machine\_type, and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=45.642) [worker\_machine\_type. In other words, all](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=47.022) [of the information required to instantiate](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=49.182) [a dataproc\_cluster. Having created our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=51.67700000000001) [cluster and obtained a handle to it, the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=53.87800000000001) [next thing we are going to do is to run](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=56.7495) [Hadoop on the cluster. Notice that we have](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=58.91914285714286) [another operator for this, the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=61.63199999999999) [DataProcHadoopOperator. This takes in a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=63.657) [JAR file, the cluster\_name, and the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=66.18699999999998) [arguments. The JAR file is defined up](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=69.00200000000001) [above. As an aside, within the cluster](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=71.40057142857141) [name, notice how we reference the words](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=73.42342857142857) [ds\_nodash within a pair of curly braces.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=77.12342857142859) [The curly braces are a way of indicating](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=80.662) [that what follows is a Jinja template, and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=83.622) [ds\_nodash is going to give the datetime in](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=86.19533333333334) [a specific format. Let's also quickly](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=90.18699999999998) [address the WORDCOUNT\_JAR. That merely](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=93.66700000000002) [points to the file part. This is on the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=96.21914285714287)[Hadoop cluster running inside Dataproc.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=99.46755555555553) [WORDCOUNT is a standard example which is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=101.662) [available on every cluster. When we invoke](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=104.34533333333334) [MapReduce, we also have to specify the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=106.702) [various input arguments, specifically the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=109.38342857142855) [output part, and that is what we do in the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=111.667) [wordcount\_args list. Coming back now to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=115.86599999999997) [our DataProcHadoopOperator, we've passed](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=118.68199999999999) [in the WORDCOUNT\_JAR part, as well as the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=120.67866666666667) [argument. We can now move on to the next](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=123.50000000000001) [task within our pipeline. And that is yet](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=126.35199999999999) [another Dataproc specialized operator, the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=129.65200000000002) [DataProcClusterDeleteOperator. We've got](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=132.662) [to specify the cluster\_name, as well as](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=134.36200000000002) [the trigger type. Notice how the trigger](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=136.70200000000003) [type is ALL\_DONE, so this cluster is going](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=139.37057142857145) [to get deleted whether or not our job is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=141.872) [successful. We line up the dependencies](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=145.1934285714285) [between these tasks, and that basically is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=146.897) [it. Here is a quick look at the text file](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=149.26200000000003) [which we are going to carry out our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=151.672) [wordcount operation on. This text file is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=154.54472727272739) [also going to be uploaded into our dags](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=156.52422222222225) [folder. But before we do that, let's just](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=159.16699999999997) [make sure we've set up all of our Airflow](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=161.212) [variables, so we use the gcloud composer](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=164.26825) [environments run command. We'd like to set](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=167.96200000000005) [an Airflow variable, which, of course, is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=170.7705714285715) [a key-value pair. Here the key is called](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=172.79199999999997) [gcs\_bucket, and the value is simply a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=176.13700000000003) [pointer to our dags directory. This value](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=178.8083636363637) [is set successfully. Let's go ahead and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=181.058) [set another. That's the gce\_zone. This was](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=183.02533333333326) [going to be used in creating our Dataproc](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=186.36109090909093) [cluster. Let's switch over to the web](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=189.27745454545465)[console, navigate to the bucket for our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=191.37342857142858) [environment, click into the dags folder,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=194.2591428571428) [and there we will upload a couple of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=196.672) [files. One is our Python code, that's the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=199.34755555555554) [hadoop\_wordcount.py, and the other is the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=203.02533333333335) [doc.txt, which we would like to subject to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=206.17700000000002) [the word count. As always, Airflow picks](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=208.76500000000004) [this up. It ignores the .txt file, but it](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=211.0086666666667) [knows to parse the Python source file, and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=214.307) [it then goes ahead and adds the DAG to its](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=217.07276923076924) [DAG bag. Because we had set a start date](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=220.88046153846156) [in the past, this DAG is already](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=223.728) [scheduled. So if we click into the graph](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=226.22200000000004) [view, we can see that it's current state](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=228.372) [is running. The dataproc\_cluster is in the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=230.97088888888882) [process of being created. That's a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=233.31977777777772) [reasonably slow process, but eventually it](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=235.47799999999998) [runs through to completion. And we can now](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=237.96199999999996) [switch over into the web console and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=240.454) [navigate through Dataproc and the Clusters](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=242.05075) [section, and we see that our](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=244.32324999999997) [spikey-wordcount-cluster has indeed come](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=247.19366666666667) [into existence. Notice also how the name](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=248.89799999999997) [has the datetime with no spaces suffixed.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=252.16450000000003) [That is because of our use of the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=255.622) [ds\_nodash special value. If we click](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=259.30927272727257) [through into this Dataproc cluster, we get](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=261.79824999999994) [a security warning. This tells us that the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=264.44199999999995) [Dataproc operators in Airflow still have a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=267.0705714285714) [few kinks which need to be ironed out. So](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=269.0777142857142) [this may not be a good idea to run in](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=271.90616666666665) [production. In any case, moving back now,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=274.4478333333333) [we can see that the MapReduce job is being](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=277.642) [executed because the highlight has moved](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=280.3042222222222) [on, and pretty quickly it moves through](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=282.35088888888885) [State: success. And then the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=285.65449999999987)[delete\_dataproc\_cluster job is](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=287.86600000000004) [highlighted, and that is successful too.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=289.112) [Let's see how long this entire operation](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=291.692) [took. So we click into the Gantt view, and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=294.28200000000004) [we see there that all of these three](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=296.978) [operations of creating a cluster, running](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=299.34599999999995) [a MapReduce job, and then deleting the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=301.5482500000001) [cluster took a total of around 6 minutes.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=304.2840000000001) [This is pretty quick, and what's more, it](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=307.692) [completely abstracted us from knowing](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=310.9603333333333) [pretty much anything about how Dataproc](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=312.652)[works. If we now navigate back into the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=315.25771428571414) [Dataproc section, there are no clusters in](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=318.7486666666667) [existence, so clearly we have managed to](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=321.2886666666666) [clean up all of our state behind us. Let's](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=322.4395000000001) [switch into the Storage browser and check](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=325.95533333333333) [on the output of our MapReduce job.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=328.3042222222222) [Remember that we had written this right](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=330.692)[into our dags directory. That was the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=333.06) [output file location. There's a folder](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=335.64699999999993) [there called wordcount, a subfolder with](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=337.672) [the timestamp, and there is the file](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=340.454) [result, the overall status, which was](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=343.31366666666656) [SUCCESS, as well as the individual files](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=345.33533333333344) [with the output. These files are sharded](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=348.30533333333324) [because they're meant to be HDFS files.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=350.46999999999997) [Let's switch back into Cloud Shell and run](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=352.672) [a gsutil cat command followed by the names](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=355.6453333333333) [of these files, and we can indeed see that](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=358.7862857142856)[our wordcount job has run through successfully.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=6&mode=live&start=361.6519999999999)

[Summary](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=7&mode=live)

[We've now come to the end of this module](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=7&mode=live&start=0.253) [and the end of this course. Let's](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=7&mode=live&start=2.233) [summarize some of what we just learned. In](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=7&mode=live&start=3.63175) [this module, we saw how we can set Airflow](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=7&mode=live&start=6.4190000000000005) [and environment variables and the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=7&mode=live&start=8.273) [different use cases. We used Airflow](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=7&mode=live&start=10.748000000000005) [variables while specifying bucket](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=7&mode=live&start=13.253) [locations to copy files from one GCS](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=7&mode=live&start=14.859) [bucket to another. Along the way, we also](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=7&mode=live&start=18.243000000000002) [demonstrated the use of the GCS Airflow](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=7&mode=live&start=20.539249999999996) [operators. We then used environment](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=7&mode=live&start=23.693000000000005) [variables to correctly configure SendGrid](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=7&mode=live&start=25.869000000000007) [to work for the Airflow email module. We](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=7&mode=live&start=28.243) [saw how SQL queries and CRUD operations on](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=7&mode=live&start=31.6355) [BigQuery can be performed using the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=7&mode=live&start=34.583) [BigQuery operators. We put together a](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=7&mode=live&start=36.949666666666666) [fairly complex demo which integrated](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=7&mode=live&start=40.0341111111111) [BigQuery, Google Cloud Storage, and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=7&mode=live&start=42.223)[SendGrid. And along the way, we also saw](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=7&mode=live&start=44.75633333333334) [how Dataproc operators can be used to spin](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=7&mode=live&start=48.04199999999999) [up Dataproc clusters, run Hadoop jobs, and](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=7&mode=live&start=51.108) [then take the cluster down. Let's quickly](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=7&mode=live&start=54.01522222222223) [take note of all of the resources that we](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=7&mode=live&start=56.963) [ought to delete. Remember that Airflow](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=7&mode=live&start=59.63157142857144) [environments incur a charge over and above](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=7&mode=live&start=61.7605) [the underlying GKE and other GCP](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=7&mode=live&start=64.51799999999999) [resources, so we should be sure to delete](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=7&mode=live&start=67.62499999999997) [them. We should also make sure to delete](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=7&mode=live&start=69.99799999999996) [an VM instances which we might have](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=7&mode=live&start=72.32499999999996) [instantiated along the way, as well as the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=7&mode=live&start=74.24800000000002) [Cloud Storage buckets. Remember that when](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=7&mode=live&start=76.43157142857142) [we delete an Airflow environment, its](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=7&mode=live&start=78.41425000000001)[bucket is not deleted by default, or](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=7&mode=live&start=80.72633333333333) [automatically. We are almost at the end of](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=7&mode=live&start=83.82966666666663) [the course. Here is a related course which](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=7&mode=live&start=85.78966666666668) [might be helpful to you for further study.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=7&mode=live&start=87.96300000000004) [This is here on the Pluralsight platform,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=7&mode=live&start=90.253) [and the author is Janani Ravi, and it's](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=7&mode=live&start=93.233) [called Architecting Serverless Big Data](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=7&mode=live&start=96.63499999999999) [Solutions Using Google Dataflow. This](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=7&mode=live&start=98.28633333333333) [course talks about a complementary](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=7&mode=live&start=100.71871428571428) [technology, Dataflow, which is more in the](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=7&mode=live&start=102.84728571428568) [streaming pipeline space, but even so,](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=7&mode=live&start=105.93299999999996) [it's useful to study Dataflow and Composer](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=7&mode=live&start=108.448) [and to be able to contrast them both. I](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=7&mode=live&start=111.213) [hope you enjoyed this course. Thank you for your time.](https://app.pluralsight.com/player?course=google-cloud-platform-composer-building-pipelines-workflow-orchestration&author=janani-ravi&name=0dc5846e-efce-4e23-a6ce-8a88ac6df88d&clip=7&mode=live&start=113.61133333333333)