



4 Easy Steps to Integrate Snowflake and Control-M

Build your database, load data and run queries in minutes



Table of Contents

[P3.](#) Data Management Meets Application Workflow Orchestration

[P4.](#) Integrating Snowflake And Control-M

1. Define Snowflake To Control-M
2. Create Your Connection Profile
3. Write SQL
4. Execute Workflows

[P11.](#) Simplify and Scale Complex Data Pipelines

[P12.](#) Helpful Resources

Data Management Meets Application Workflow Orchestration

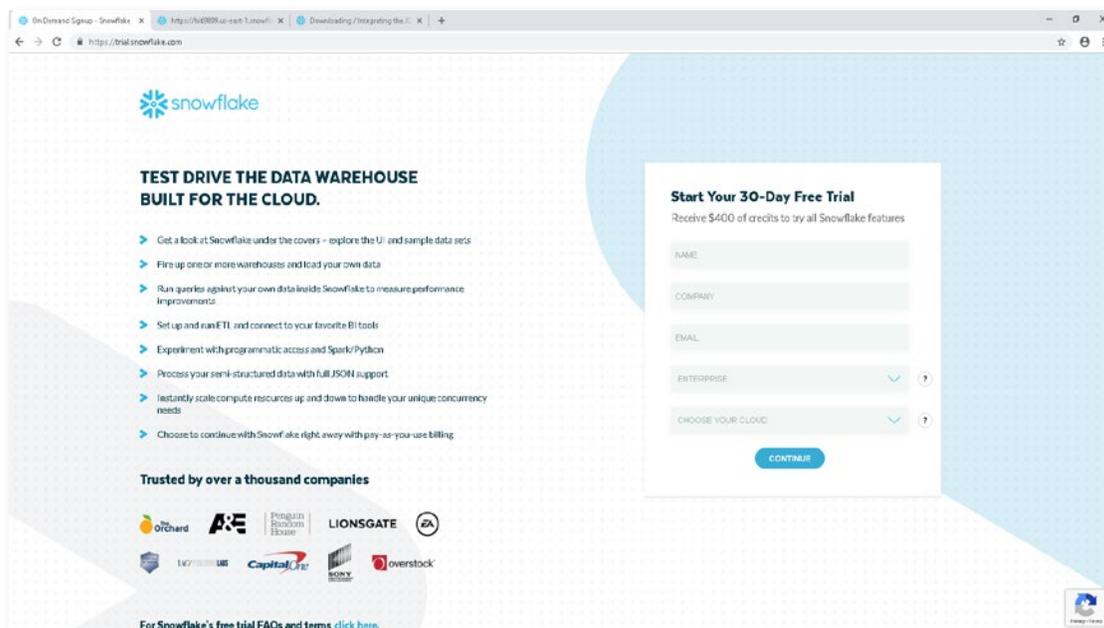
If you're reading this white paper, you probably work with data – a lot of data. You most likely have more data sources than you can count: your company's websites, social media accounts, inventory records, sales transactions, IoT devices, etc. It's an ever-growing list. You probably also have an arsenal of tools to help you ingest, extract, transform, process, and report on all this data. Collecting data and turning it into actionable insights is yesterday's problem.

Today's challenge is how to take all these data sources and data management tools, and build an automated data pipeline that requires minimal human intervention. Sound too good to be true? It's not.

In this white paper, we'll demonstrate how you can quickly connect **Snowflake**, a leading data warehouse solution, with **Control-M**, a powerful application workflow orchestration product. The result – you get enterprise-grade operational control over your data from end-to-end workflow visibility to logs and output capture and management. Control-M can help you weave Snowflake (and all your other key technologies) into your entire data pipeline, in the cloud, on-premises, or both.

In the next section you'll see how you can **integrate Snowflake and Control-M in four easy steps**.

Note: If you do not already have a Snowflake account, you can start a free trial at <https://trial.snowflake.com>



Integrating Snowflake and Control-M

This paper covers how to use Control-M to automate Snowflake activities like defining databases and tables, and executing SQL to load data and run queries. Once connected, you can take a Jobs-as-Code approach, coding in JSON and invoking services using REST APIs, or use Control-M's graphical interfaces to build and execute workflows.

The four steps to integrate Snowflake and Control-M include:

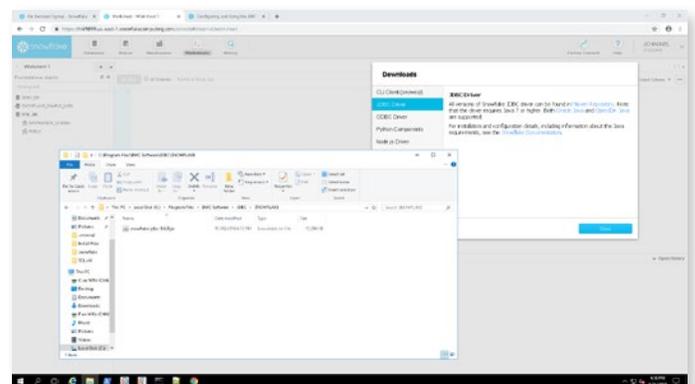
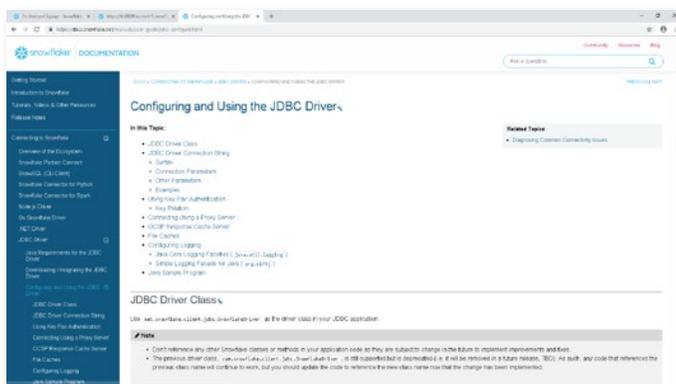
1. Define Snowflake to Control-M
2. Define your connection profile
3. Write SQL
4. Execute workflows

1

Define Snowflake to Control-M

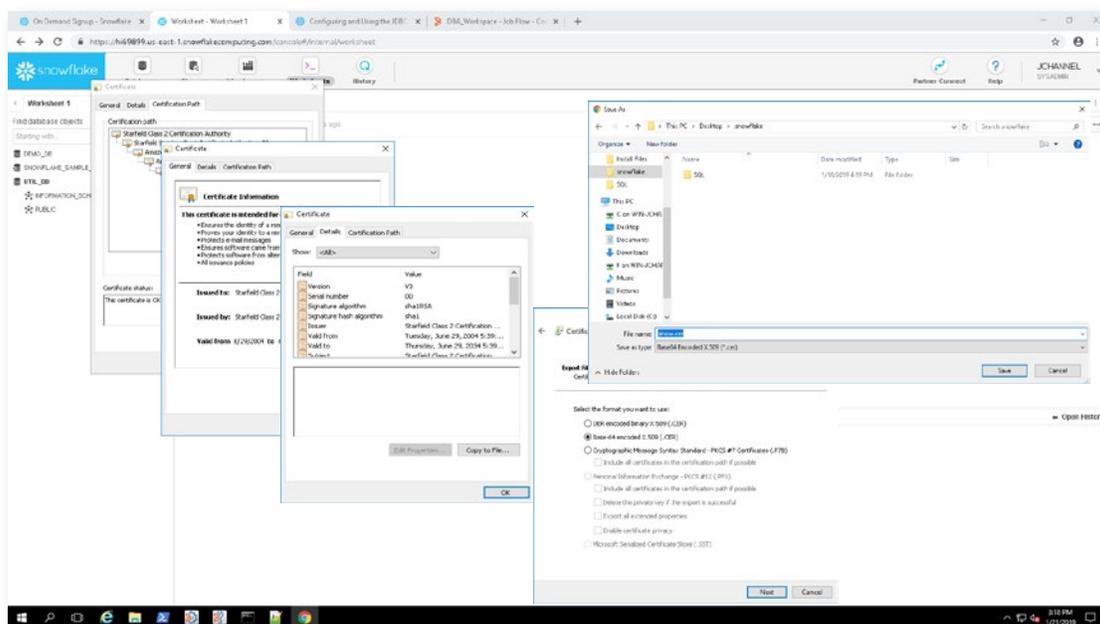
Note: This activity is typically required only once per installation via Control-M's configuration manager. Download Snowflake's JDBC driver

- In the Snowflake console, select Help > Downloads.
- Selecting JDBC Driver displays text and a link to the Maven Repository which contains the JAR files. The snowflake-jdbc-3.7.1.jar was the current driver when this document was written.
- Click on the desired JAR file to download it.
- Place the JDBC driver JAR file in a location suitable for storing operational software, like C:\Program Files\BMC Software\JDBC\Snowflake.



Download the SSL certificate

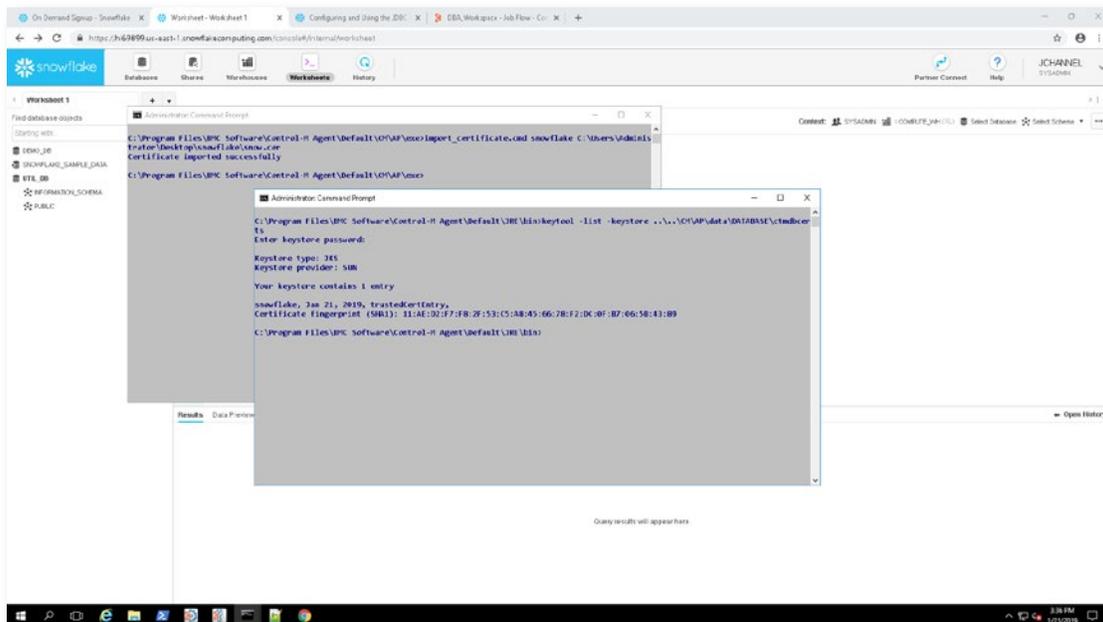
- Snowflake uses SSL. To download Snowflake's SSL certificate, navigate to your Snowflake account using a browser like Google Chrome.
- Click on the lock icon to the left of the URL in the address bar to open connection information.
- Select Certificate to open the Certificate form.
- Select the Details (second) tab.
- Click Copy to File to open the Certificate Export Wizard.
- Click Next to see the format options. Select the second radio button Base-64 encoded X.509 (.CER), and press Next.
- Specify a file and click Next to finish. This certificate is used only once, so any location is fine.



Import the Snowflake certificate into the Control-M Agent/Database keystore by running the following utility¹

```
"<Control-M Agent Home directory>\Default\CM\JRE\bin\keytool -import -alias snowflake -keystore "<
Control-M Agent Home directory>\Default\CM\AP\data\security\apcerts" -storepass appass -file <
Snowflake certificate from previous step>
```

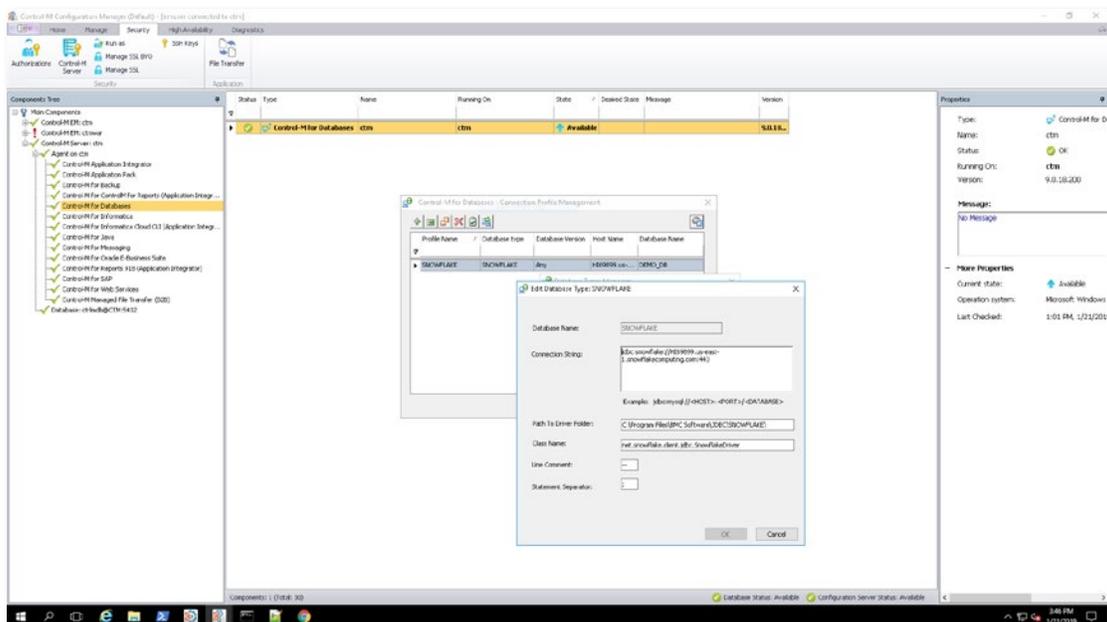
Note: This is a single line of code.



¹ These instructions were verified using Control-M 19. Older versions use different utilities.

Create a custom database type in the CCM

- Open the CCM, right click on Control-M for Databases, and select Connection Profile Management. This opens the Connection Profile Management form.
- Select the Database Type Manager icon (right hand side of the Connection Profile Management form) to open the Database Types Manager form.
- Press the plus (+) icon to open the Add New Database Type form.
 - Fill in the details and select OK to add the database type
 - For Snowflake we have provided a name, JDBC connection string, a path to the JDBC driver location and the class name to use (refer to the Snowflake JDBC documentation).

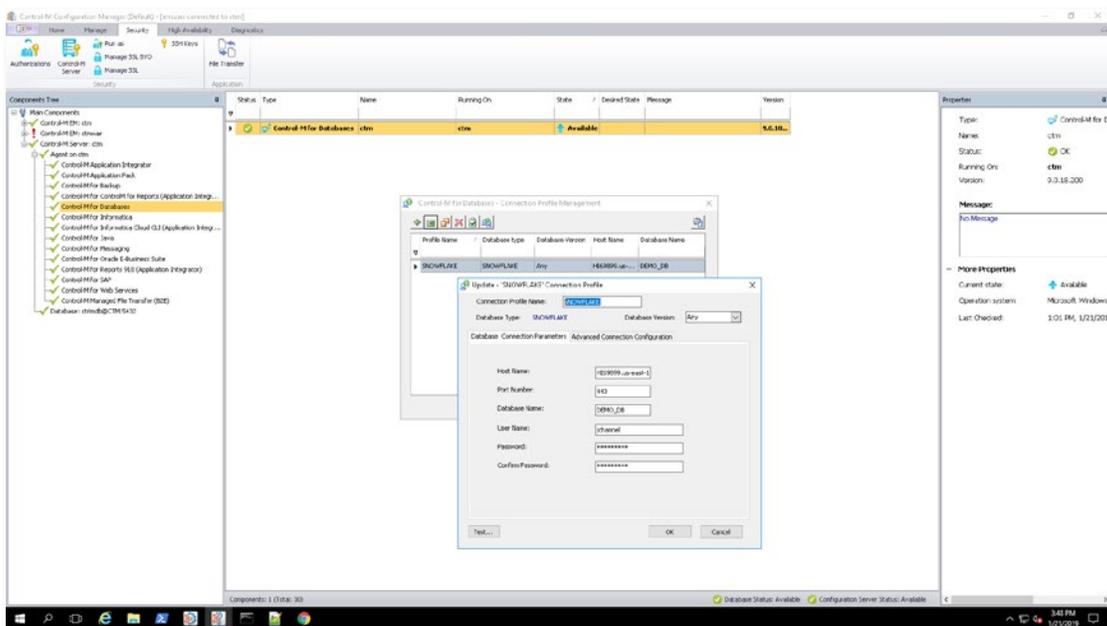


2

Create your connection profile

Navigate to the same Control-M for Databases branch used in the previous step

- Right click and select Connection Profile Management to open the form.
- Select the plus (+) icon on the left side of the form to open the Add Connection Profile form.
- For Connection Profile Name, use any meaningful string like SNOWPROD.
- Select Snowflake from the Database Type drop down edit list and leave Any in the Database Version field.
- Click Next to go on to fill in the remaining information about your Snowflake database environment.
- Note: you can access all databases granted to the user you specify, not only the database defined in this form.



3

Write SQL

There are no special considerations for the SQL scripts that can be executed by Control-M. Several samples are provided in this Github repo location.

Here's an example:

```
use database sf_tuts;
copy into emp_basic
from @%emp_basic
file_format = (type = csv field_optionally_enclosed_by='')
pattern = '*.employees0[1-5].csv.gz'
on_error = 'skip_file';
select * from emp_basic;
```

4

Execute workflows

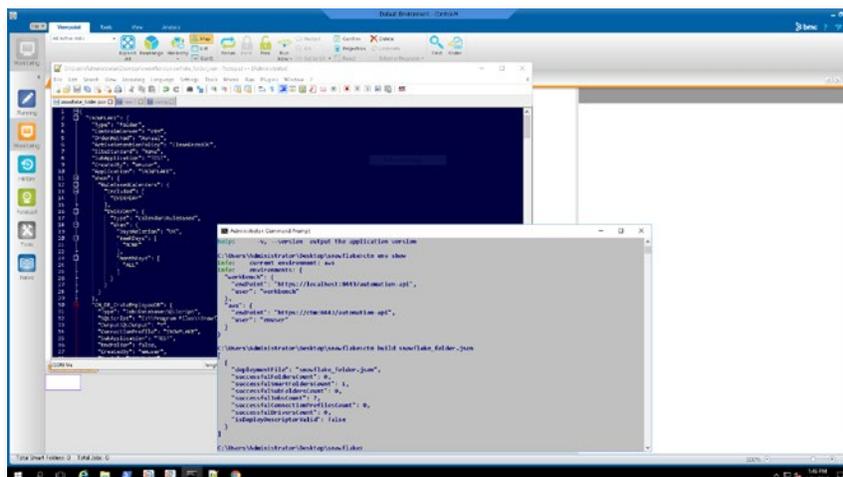
Now that you have connected Snowflake and Control-M, you can build and execute workflows. Control-M provides both programmatic and graphical tools. So, you can code workflows in JSON, use Control-M's web interface, or Control-M's workload

automation client. The programmatic and graphical methods are completely interchangeable. This means you can start with one, switch to the other and go back and forth between the two.

Here's how to get started:

Take a Jobs-as-Code approach to building and monitoring Control-M workflows

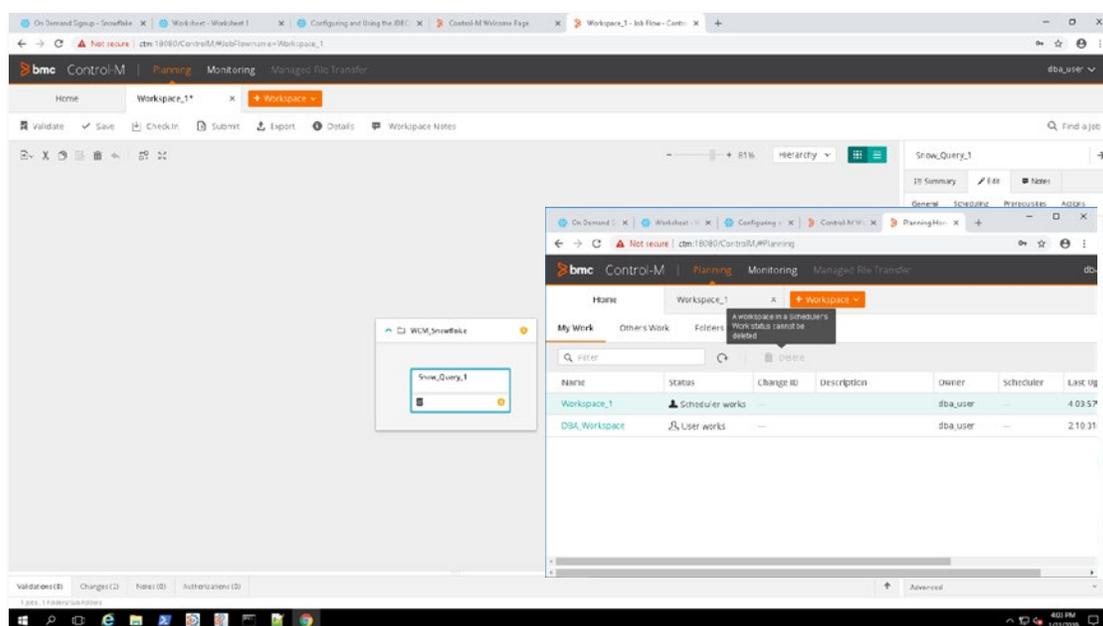
- Build Control-M workflows using JSON. The following samples are available [here](#):
 - **create_snowflake_db.json** executes a SQL script to create a database.
 - **cust360.json** demonstrates a workflow composed of several job types including job **C360_LoadAddresses** which loads data into a Snowflake table.
- Run Snowflake jobs using Control-M Automation API
 - Use either the **ctm cli** (requires node.js) or direct REST APIs to validate, deploy and run your jobs. See [documentation here](#) for more details.



Build and run jobs using graphical interfaces

- Build and run jobs using **Control-M Web**.
- Build and run jobs using **Control-M Workload Automation client**
- Find documentation about these interfaces [here](#)

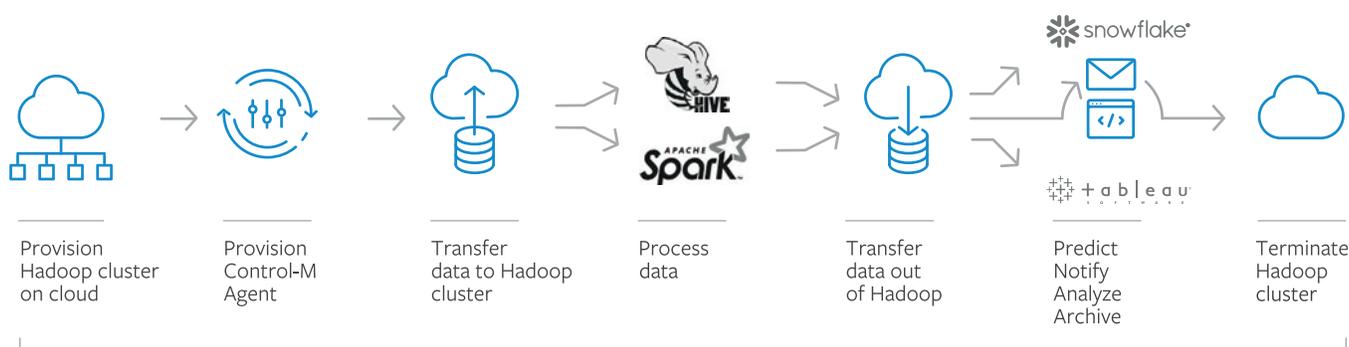
Note: if you would like to learn more about setting up and executing workflows in Control-M, please click [here](#) for a guided trial.



Simplify and Scale Complex Data Pipelines

That's it! With these four steps, you have successfully connected Snowflake with the power of application workflow orchestration.

Control-M can automate your entire data pipeline, allowing you to ingest and process data from all kinds of platforms, including Hadoop, Spark, EMR, RedShift and others.



Control-M Workflow Orchestration

With Control-M you will spend more time uncovering actionable intelligence, and less time worrying about the movement of data and files. Control-M gives you an end-to-end view of data pipelines at every stage from data ingestion to processing to analytics. You'll be able to manage business SLAs for service delivery and resolve critical issues before deadlines are missed.

Now, it's time to go and put your data to work for you.

Learn more

To learn more about how Control-M can support your big data initiatives, visit bmc.com/it-solutions/control-m-big-data.html

HELPFUL RESOURCES

- 🌐 Snowflake:
 - [Sign up for a trial](#)
 - [Getting Started Guide](#)
- 🌐 Control-M:
 - [Control-M for databases datasheet](#)
 - [Control-M for big data datasheet](#)



About BMC

BMC helps customers run and reinvent their businesses with open, scalable, and modular solutions to complex IT problems. Bringing both unmatched experience in optimization and limitless passion for innovation to technologies from mainframe to mobile to cloud and beyond, BMC helps more than 10,000 customers worldwide reinvent, grow, and build for the future success of their enterprises.

BMC – Run and Reinvent

www.bmc.com



BMC, BMC Software, the BMC logo, and the BMC Software logo, and all other BMC Software product and service names are owned by BMC Software, Inc. and are registered or pending registration in the US Patent and Trademark Office or in the trademark offices of other countries. All other trademarks belong to their respective companies. © Copyright 2019 BMC Software, Inc.

