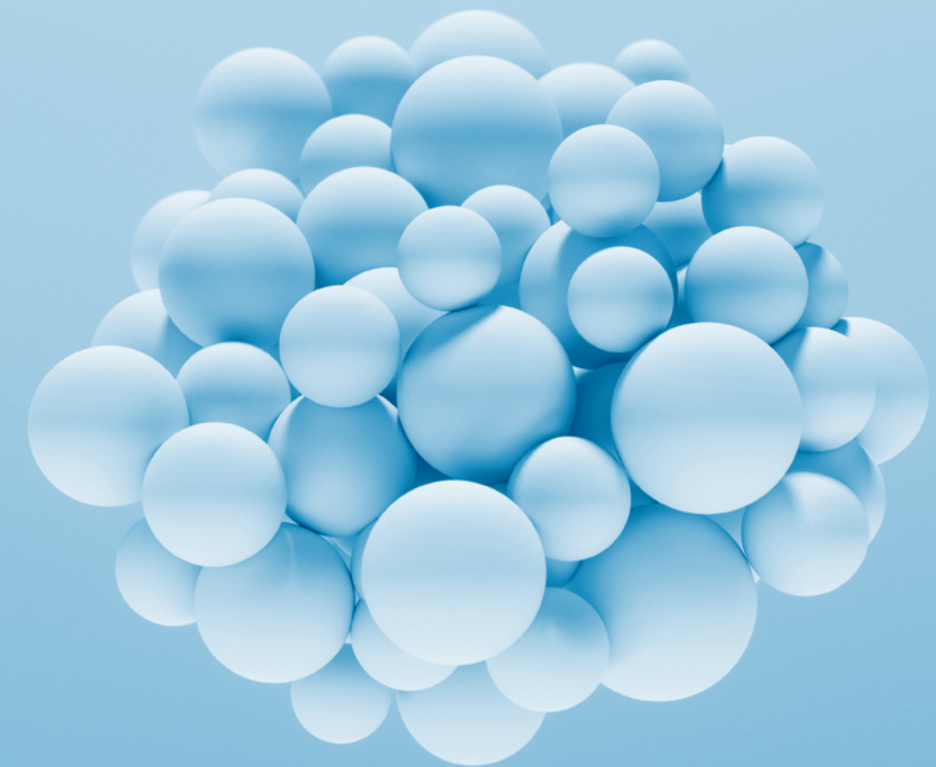


E-BOOK

Assessing Data Center Resources for Cloud Migration

 **NetApp**



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1. Identify what you have

[Watch video](#)

Assessing your environment for cloud migration

Whether you're moving your first application or your fiftieth, cloud migration can be a challenging and error-prone operation. Because users can be unforgiving, the efficiency of your migration process is critical. Important applications and services are expected to be available immediately, and if performance or availability challenges arise after the migration, you're sure to hear about it.

The cloud is not a panacea for tight IT budgets. You need to optimize infrastructure use for migrated applications and keep a close eye on ongoing resource consumption. Otherwise, you may see usage—and cost—increases that you didn't expect.

Cloud insights can help you to

Monitor your cloud and on premises systems with a single tool

Find performance issues 5 times faster

Optimize your growing cloud spend and save up to 30%

NetApp® Cloud Insights is a unique hybrid cloud monitoring tool that gives you visibility and insight across data center and cloud environments. A single monitoring tool that works across multiple environments simplifies migrations, reduces stress on IT teams, and helps ensure continuity of operations.

This e-book explores how Cloud Insights and other NetApp cloud solutions can help you assess your on-premises environment prior to migration.

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Identify what you have

The first step in any cloud migration is to assess what applications you have and where they are running. Whether you're moving a set of applications or an entire data center, you need to identify all the resources—VMs, storage volumes, etc.—to be moved and map them to analogous resources in your chosen public cloud or clouds. Cloud Insights simplifies these tasks.

Cloud Insights provides a flexible query mechanism that enables you to search for assets at a granular level based on a wide range of criteria using flexible filters and finders. For example, you can find all of the virtual machines (VMs) in your environment regardless of hypervisor, or find only the VMs that are associated with a specific hypervisor, a specific host, or a specific application. You can flexibly search for VMs, storage, or other asset types. Figure 1 shows an example. When you create a query, you can easily save it for future use.



NetApp CDS Sa... / All Queries / Find My NANE Storage

Last 24 Hours Save

Storage

Filter By Name Any IP 10.197.

Query Results (2)

| Name ↑ | IP | Capacity - Raw (GB) | Family | Model | Microcode Version | IOPS - Total (IO/s) | Latency - Total (ms) |
|--------|---------------|---------------------|---------|---------|----------------------------|---------------------|----------------------|
| tawny | 10.197.143.25 | 80,020.27 | FAS6200 | FAS6210 | 8.3.2 clustered Data ONTAP | 3,954.15 | 0.46 |
| tokaji | 10.197.143.37 | 87,091.43 | FAS3200 | FAS3270 | 8.3.2 clustered Data ONTAP | 424.31 | 0.10 |

Figure 1. A Cloud Insights query to find storage based on subnet.

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Identify what you have

Using custom dashboards

If your data center has standard naming conventions, you can use that knowledge in your query to quickly identify target resources. Cloud Insights also provides powerful annotations that allow you to add custom data to your environment that is specific to your needs and your business. Annotations offer another avenue by which to assess your environment.

Using a combination of these capabilities, you can quickly identify the right list of target resources for your migration.



Discovery

NetApp Cloud Insights is able to quickly discover almost everything in your environment across data center and cloud boundaries. Easy-to-configure data collectors gather information from



Asset normalization

With asset normalization, Cloud Insights does the hard work of ensuring that metrics are comparable across platforms. With its normalized data model, a VM is a VM whether it's on your premises or in a public cloud.

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2. Rightsizing resources

Identifying the list of resources to move to the cloud is just the first step. In a data center environment where the hardware is paid for, overprovisioning for both VMs and storage is common. As long as you manage hypervisor resources effectively, it doesn't cost more to have a VM with 16 vCPUs versus 8, so why not? The same level

of over provisioning in the cloud, however, can double your costs. If you want your migration to be as cost effective as possible, you have to rightsize resources as you migrate them. Cloud Insights makes it easy to identify both over- and underprovisioned resources.

About Cloud Insights

To get the most from Cloud Insights, you need to configure annotations, queries, alerts, and dashboards for your environment:

- **Data deduplication:** Any dataset contains a certain amount of duplication at the file and block levels. Deduplication detects when a block being written is identical to an existing block and saves a pointer rather than writing the block again. Savings can be substantial, especially in virtualized environments and for backup and archive data.
- **Queries** provide powerful filters and finders that let you easily monitor and troubleshoot a hybrid cloud environment. You can search assets at a granular level based on various criteria, including annotations and performance metrics.

- **Alerts** define your performance policies, notifying your team when a resource exceeds a specific service level. With alerts, you can proactively monitor your environment and detect problems before they affect your operations. You can create targeted alerts to detect problems while reducing the noise in your monitoring environment to avoid alert fatigue.
- **Dashboards** are designed to help you answer specific questions about your environment. A default set of dashboards is configured automatically based on the data collectors that you enable, and you can create highly tailored dashboard views to meet diverse monitoring and troubleshooting needs.

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Rightsizing resources

Identifying overprovisioned VMs

Most tools that are designed to lift and shift VMs to the cloud just map the on-premises VM to the closest cloud equivalent without rightsizing. With Cloud Insights, the process of finding overprovisioned VMs is simply a matter of creating a query to find VMs with a lot of processors and low CPU utilization, as shown in Figure 2.

The VMs identified are good candidates for downsizing as you migrate them to the cloud. Without this information, you would probably just migrate these VMs into the cloud without adjustment.

For example, in AWS you would probably choose an m4-4xlarge EC2 instance when a 2xlarge or even an xlarge instance would do the job at a quarter the cost.

If you already have a query to find the target set of VMs for your migration, you can refine that query to find overprovisioned VMs by adding the additional filters shown in Figure 2 to the existing query. (Be sure to save the query with a new name for future use.)

To find under provisioned VMs, the process is similar except that you filter for VMs with high CPU utilization.

The screenshot shows the NetApp Cloud Insights interface. The top navigation bar includes 'Cloud Insights', a search icon, and the user name 'Joshua Moore'. The main content area is titled 'NetApp CDS Sa...' and shows a query filter for 'Virtual Machine'. The filter criteria are: 'Name Any', 'Processors >= 16', and 'CPU Utilization - Total (%) <= 15'. The query results are displayed in a table with 64 results. The table columns are: Name, Capacity - Total (GB), Capacity - Used (GB), OS, Memory (GB), Processors, Hypervisor Name, Power State, and Application. The first three rows are visible:

| Name | Capacity - Total (GB) | Capacity - Used (GB) | OS | Memory (GB) | Processors | Hypervisor Name | Power State | Application |
|-----------------------|-----------------------|----------------------|------------------------------------|-------------|------------|------------------------|-------------|-------------|
| CloudCompliance-a9... | 500.00 | N/A | CC_rc/52.6.0_20200125200742 x86_64 | 64.0 | 16 | us-east-1c | On | |
| NAS_Bridge_2.1 | 533.11 | 520.33 | Debian GNU/Linux 7 (64-bit) | 32.0 | 16 | hci-comp2.demofr.co... | On | |
| Test_NAS_Bridge | 200.11 | 200.11 | Debian GNU/Linux 9 (64-bit) | 48.0 | 16 | hci-comp2.demofr.co... | On | |

Figure 2. A query to find large VMs with low CPU utilization

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Rightsizing resources

Mapping storage to the right cloud tier

Many data centers use all-flash arrays, which provide great savings in power, cooling, and rack space. There's a strong temptation to think that if you have 100TB of flash storage on the premises, then you'll need 100TB of flash storage in the cloud. However, this is usually not necessary and will greatly increase your cloud spend. It's important to choose storage in terms of I/O needs rather than capacity alone.

Cloud Insights makes it simple to look at the I/O needs of each storage volume to choose the right tier of storage and optimize costs. A good metric to use for this is I/O density, the number of I/Os per TB of storage, as shown in Figure 3.

The volumes identified by this search are candidates to go in a more economical tier of storage. For example, AWS offers its General Purpose 2 (GP2) storage tier. When people don't know what they need, they often choose GP2. However, this tier offers I/O performance that is quite high, and it comes at a premium. By checking the performance needs of volumes with Cloud Insights, you can allocate many volumes to lower tiers of storage, potentially cutting spending in half. Figure 4 shows an example AWS dashboard that shows potential saving that would result from switching from GP2 to a lower tier of storage.

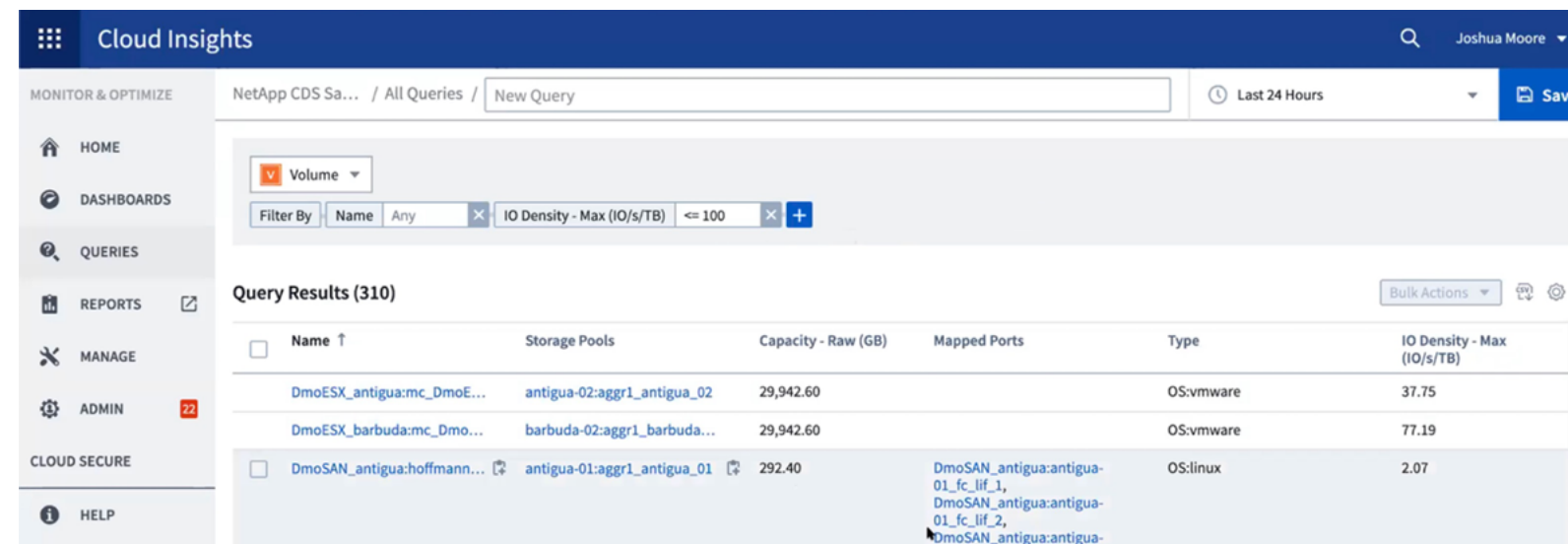


Figure 3. A query to find storage volumes with low I/O needs

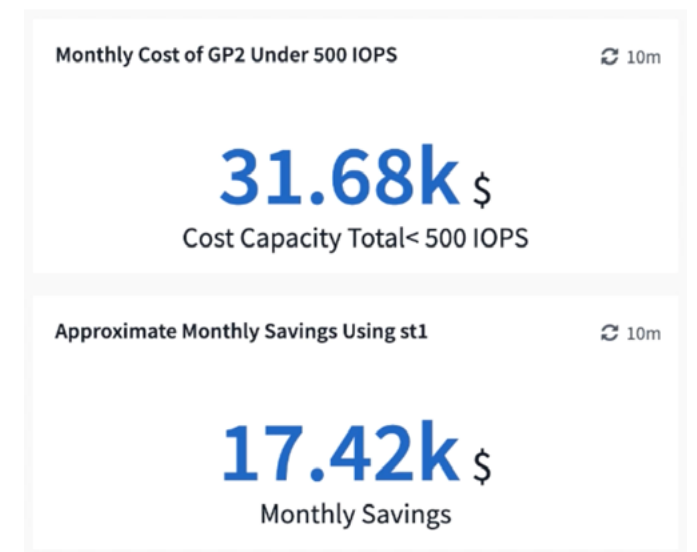


Figure 4. Potential savings from switching low I/O volumes from GP2 to storage tier 1 (st1).

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Rightsizing resources

Using dashboards to track storage waste

Cloud Insights also makes it easy to create dashboards to look for overprovisioned cloud storage on an ongoing basis. Figure 5 shows a dashboard that NetApp uses for its sandbox environment in AWS, illustrating an opportunity for significant monthly savings. From this type of dashboard, it's possible to drill down on individual volumes to see whether corrective action is needed.

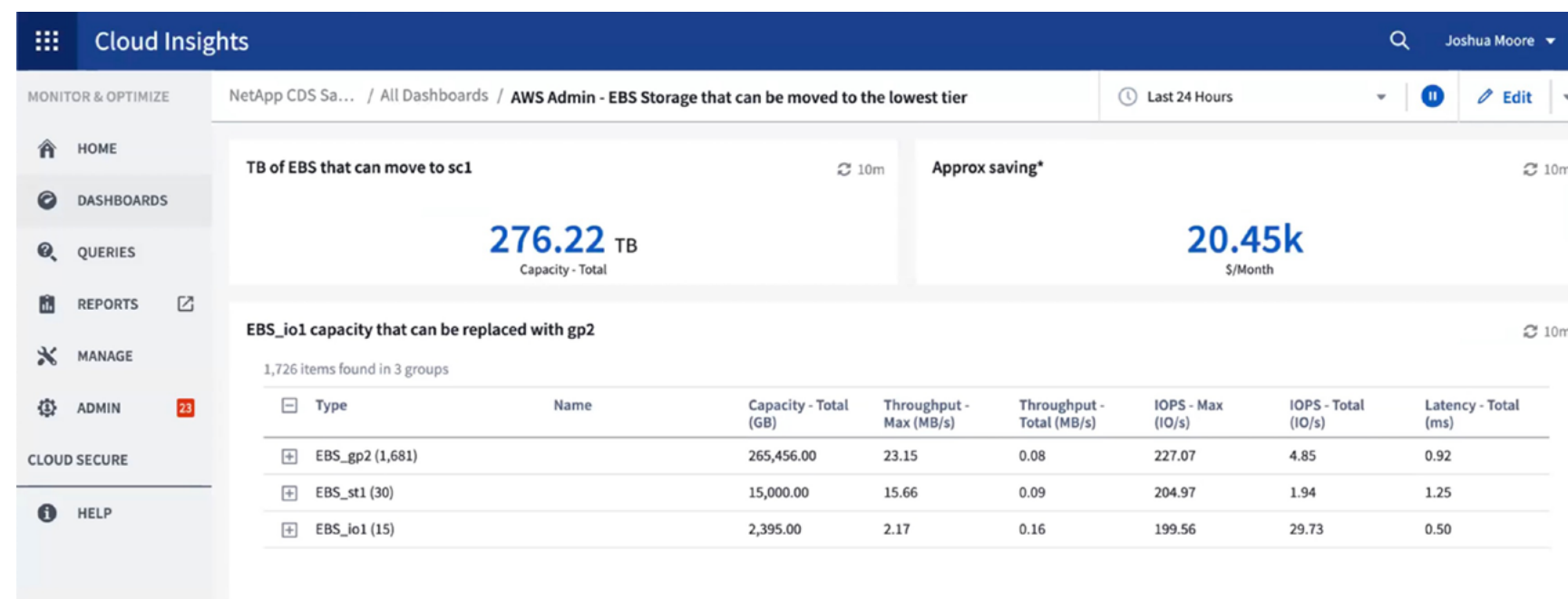


Figure 5. Dashboard showing the amount of Elastic Block Storage (EBS) that could be reallocated to a lower tier at substantial savings.

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3. Sizing your migration

Once you've identified the VMs and storage volumes to move to the cloud, rightsized the VMs, and identified the best storage tier for each volume, you can begin planning and sizing your migration. The initial result is typically a list of VMs and storage volumes that need to be moved. For VMs you'll identify a target cloud instance, and for storage volumes you'll identify the necessary capacity and target cloud storage tier. Because the person doing the migration is often different from the person doing the assessment, Cloud Insights can export CSV files that can be imported into Excel or other programs for additional work.

In most migrations, it's typical to categorize your environment based on different applications and then establish the priority for each application. This process can—and usually should—include identifying applications that can be decommissioned.



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4. Getting started with Cloud Insights

This e-book explains all the ways that Cloud Insights accelerates the cloud assessment process while reducing errors and risk. To see Cloud Insights in action for yourself, register for a 30-day free trial. Go to NetApp Cloud Central at <https://cloud.netapp.com/cloud-insights> to learn more about NetApp Cloud Insights and start your free trial.

Additional resources

[NetApp Cloud Insights: A New Way to Monitor Your Cloud Infrastructure](#)

[Enhance Monitoring by Understanding the Relationships Between Resources](#)

[Keep Cloud Costs at Bay with Queries in Cloud Insights](#)

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In a world full of generalists, NetApp is a specialist. We're focused on one thing, helping your business get the most out of your data. NetApp brings the enterprise-grade data services you rely on into the cloud, and the simple flexibility of cloud into the data center. Our industry-leading solutions work across diverse customer environments and the world's biggest public clouds.

As a cloud-led, data-centric software company, only NetApp can help build your unique data fabric, simplify and connect your cloud, and securely deliver the right data, services, and applications to the right people—anytime, anywhere.

