Linux Infrastructure Operations, Virtualization, and Observability

This body of work demonstrates hands-on Linux systems administration across application and web servers in a virtualized enterprise environment. The tasks reflect real-world operational responsibilities, spanning system configuration, maintenance, virtualization lifecycle management, and centralized logging for visibility and troubleshooting.

The work includes filesystem and access management activities such as creating and validating symbolic links to support web applications without duplicating data, ensuring clean directory structures and controlled file access. System maintenance is represented through verified package upgrades and validation of critical components, including core system libraries and database services, confirming system stability and upgrade success on CentOS-based servers.

Virtualization tasks were performed using VMware vSphere, covering the full lifecycle of virtual machines. Activities include cloning existing application servers, selecting appropriate compute resources and datastores, validating compatibility, configuring virtual hardware, and confirming successful deployment through post-clone verification. Resource adjustments such as memory configuration were applied and validated both at the hypervisor level and within the guest operating system to ensure changes were properly recognized.

Centralized logging and observability were achieved using Graylog, enabling real-time and historical analysis of logs collected from multiple hosts. Log searches and message reviews captured authentication events, service state changes, Filebeat log shipping behavior, mail and permission errors, and application-level activity. These insights support troubleshooting, auditing, and operational awareness across the environment.

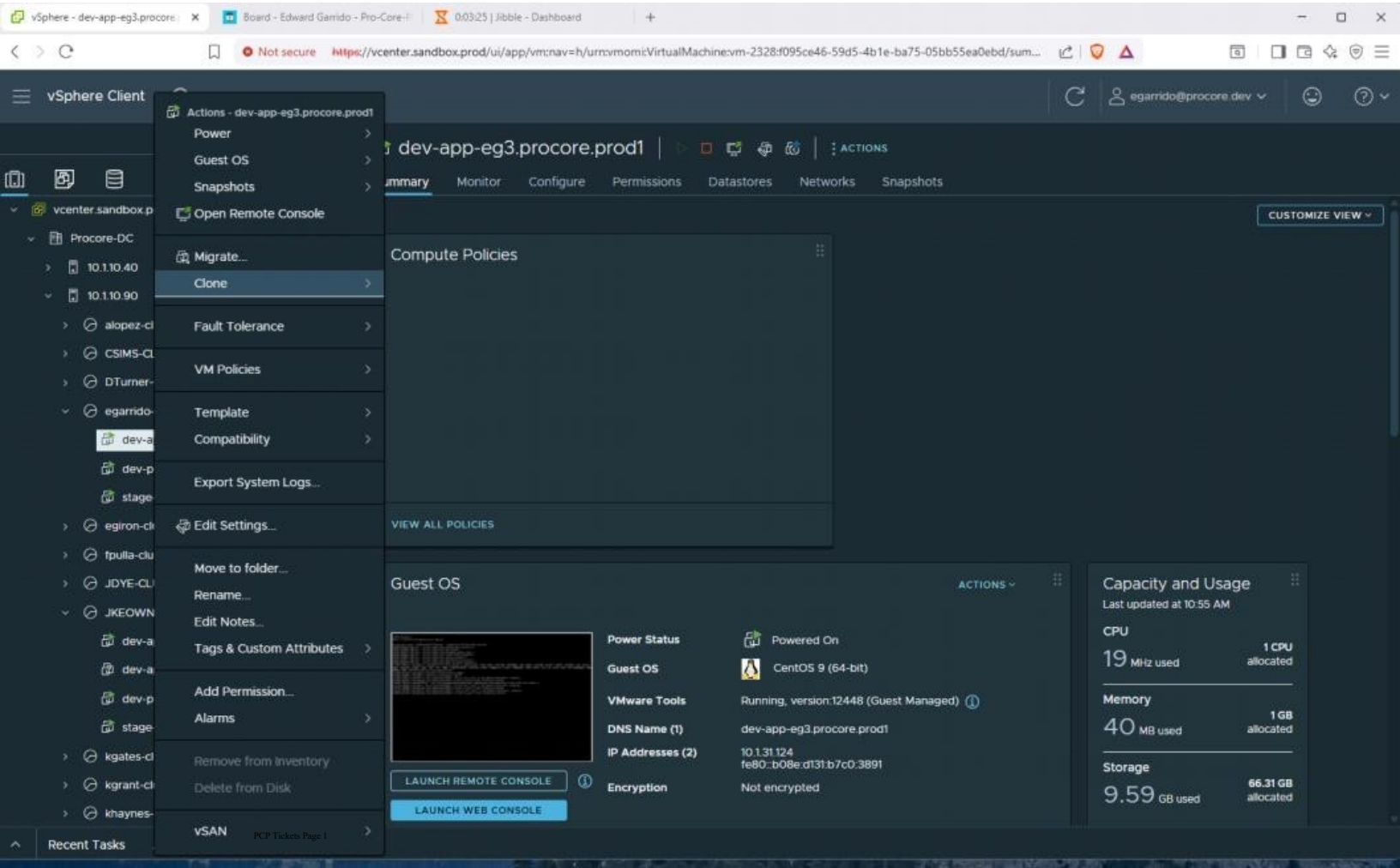
Collectively, these tasks highlight practical experience with Linux administration, VMware-based virtualization, system verification, and centralized log analysis. The work emphasizes accuracy, validation, and operational reliability—core skills essential for systems administration, production support, and infrastructure-focused roles.

The VMware vSphere Client interface is being used to manage a virtual machine within a production vCenter environment.

The selected virtual machine is an application server, and the Actions menu is open, showing available administrative operations such as power management, guest OS actions, snapshot management, cloning, migration, and system log export.

The summary pane displays key virtual machine details, including power status, guest operating system (CentOS 9 64-bit), VMware Tools status, DNS name, IP addressing, and encryption state. Resource utilization metrics for CPU, memory, and storage are also visible, providing a quick operational overview of the VM’s current state.

This view demonstrates active infrastructure management using VMware vSphere to monitor, administer, and perform lifecycle operations on virtual machines in an enterprise environment.

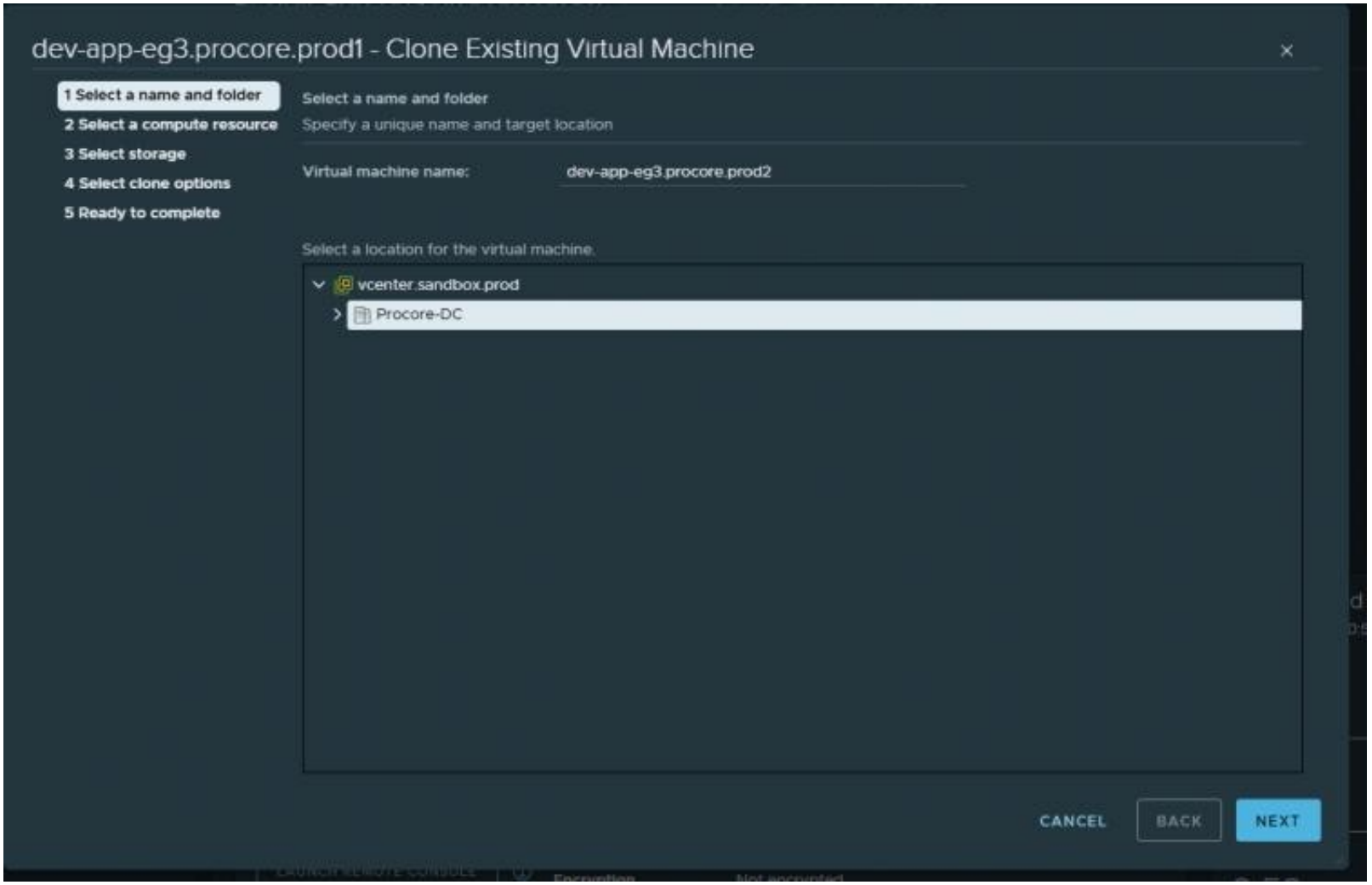


The VMware vSphere Client clone wizard is in use to create a new virtual machine from an existing application server.

The workflow is at the Select a name and folder step, where the new VM name has been defined as dev-app-eg3.procore.prod2 and the target location is being set within the vcenter.sandbox.prod environment under the Procore-DC datacenter.

The left-hand progress panel shows the full cloning sequence, including selecting compute resources, storage, clone options, and final review before completion.

This step establishes the VM’s identity and placement within the vCenter inventory, forming the foundation for consistent provisioning and lifecycle management in the virtualized environment.

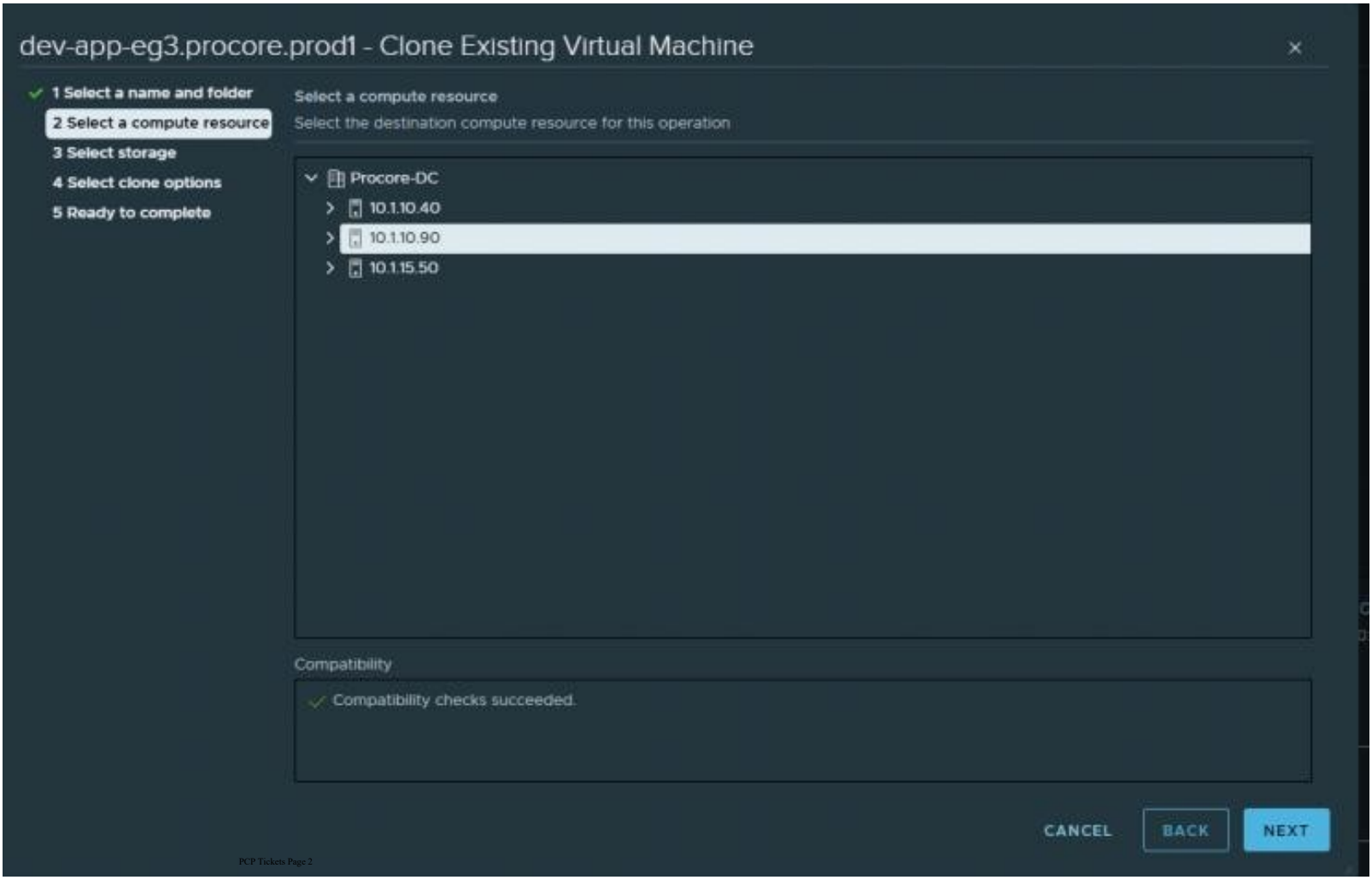


The VMware vSphere Client clone wizard is in the Select compute resource stage for creating a new virtual machine from an existing application server.

A destination host is being chosen within the Procore-DC datacenter, with available ESXi hosts listed by IP address. One host is selected as the target compute resource for the cloned virtual machine.

A compatibility check is shown as successful, confirming that the selected host meets the requirements to run the cloned VM.

This step determines where the virtual machine’s CPU and memory resources will be provided, ensuring proper placement and operational compatibility within the virtualized environment.

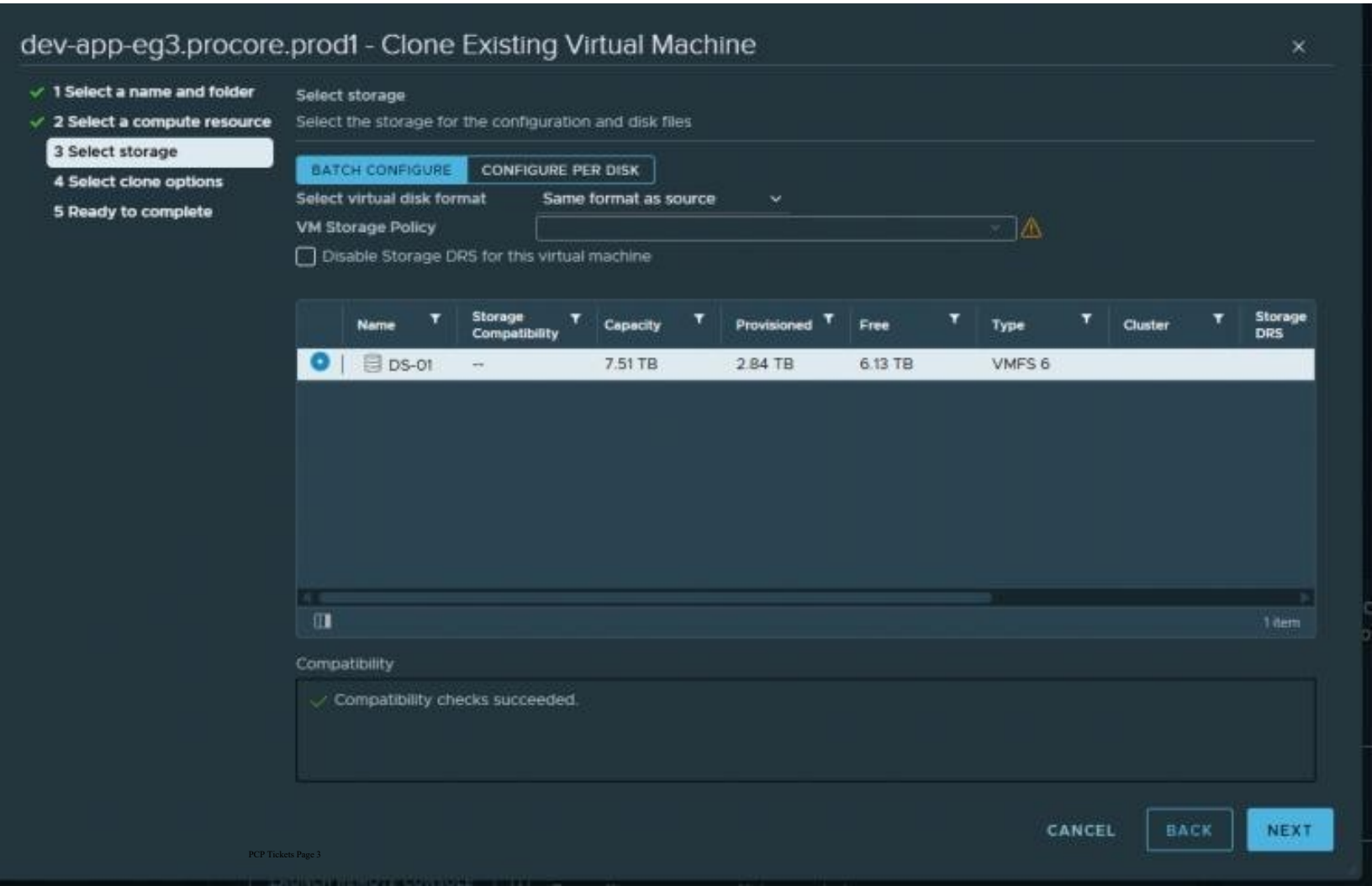


The VMware vSphere Client clone wizard is in the Select storage phase of the virtual machine cloning process.

A datastore named DS-01 is selected to host the cloned virtual machine’s configuration files and virtual disks. Storage details are displayed, including total capacity, provisioned space, available free space, datastore type (VMFS 6), and cluster association.

The virtual disk format is set to Same format as source, ensuring consistency with the original VM’s disk layout, and storage policies are left unchanged. A successful compatibility check confirms that the selected datastore meets all requirements for the clone operation.

This step defines where the VM’s data will reside and ensures sufficient capacity and compatibility before proceeding to clone options and final deployment.

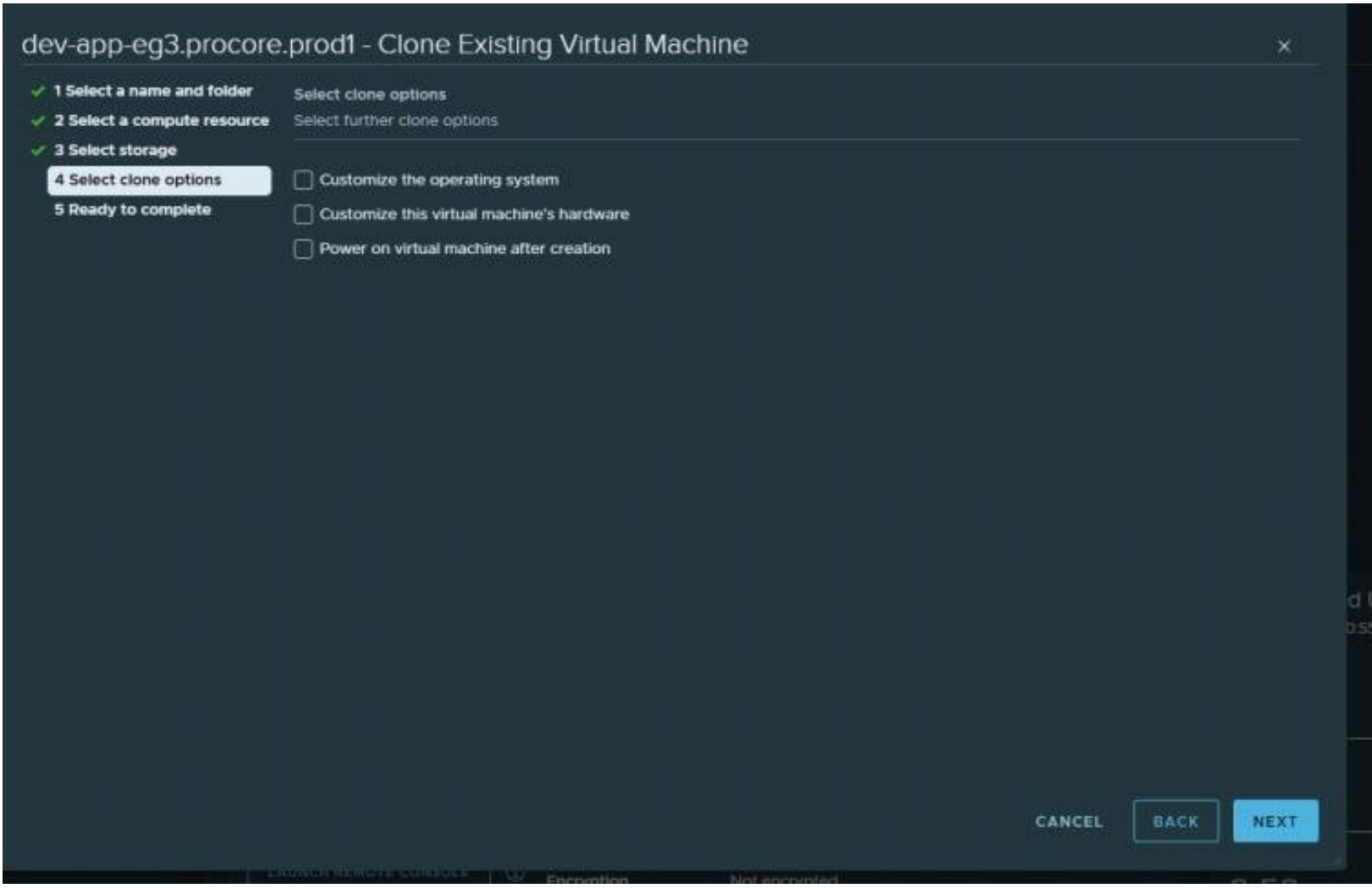


The VMware vSphere Client clone wizard is at the Select clone options step of the virtual machine cloning process.

This stage presents configuration choices that control how the cloned virtual machine is deployed after creation.

Options are available to customize the guest operating system, modify the virtual machine’s hardware configuration, and automatically power on the VM once the clone operation completes. None of the options are selected, indicating the clone will be created with the same operating system and hardware settings as the source virtual machine and will remain powered off after deployment.

This step ensures controlled, predictable provisioning by allowing customization only when explicitly required.

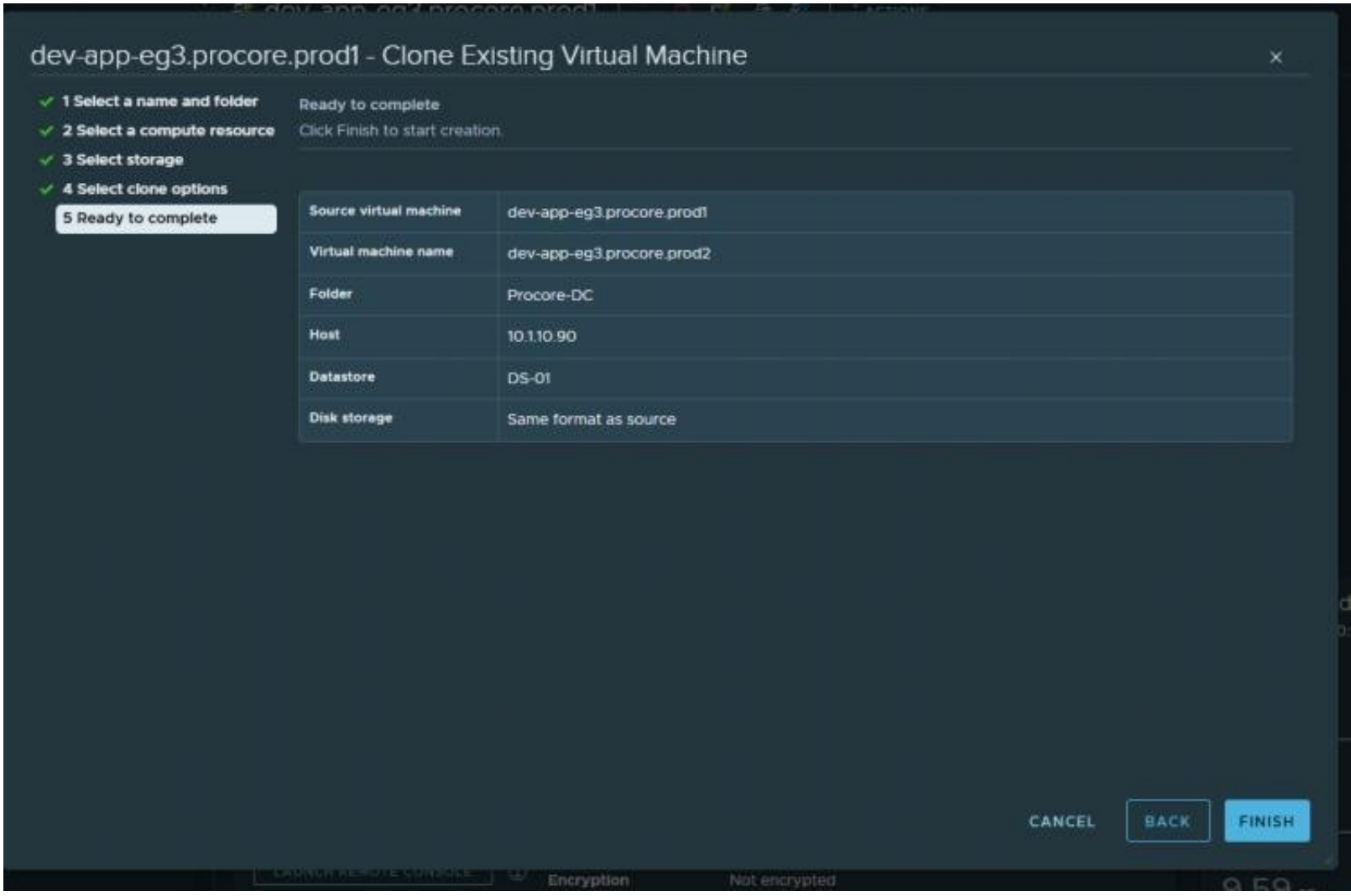


The VMware vSphere Client clone wizard is at the Ready to complete stage, providing a final summary of the virtual machine cloning configuration before deployment.

The source virtual machine is listed along with the new virtual machine name, confirming the clone target and ensuring proper identification within the environment.

Key deployment details are displayed, including the destination folder and datacenter, selected ESXi host for compute resources, datastore assignment, and disk storage format set to match the source virtual machine. This summary allows verification that compute, storage, and placement selections align with operational requirements.

This step serves as a final validation checkpoint, ensuring the virtual machine clone configuration is accurate before initiating the creation process.



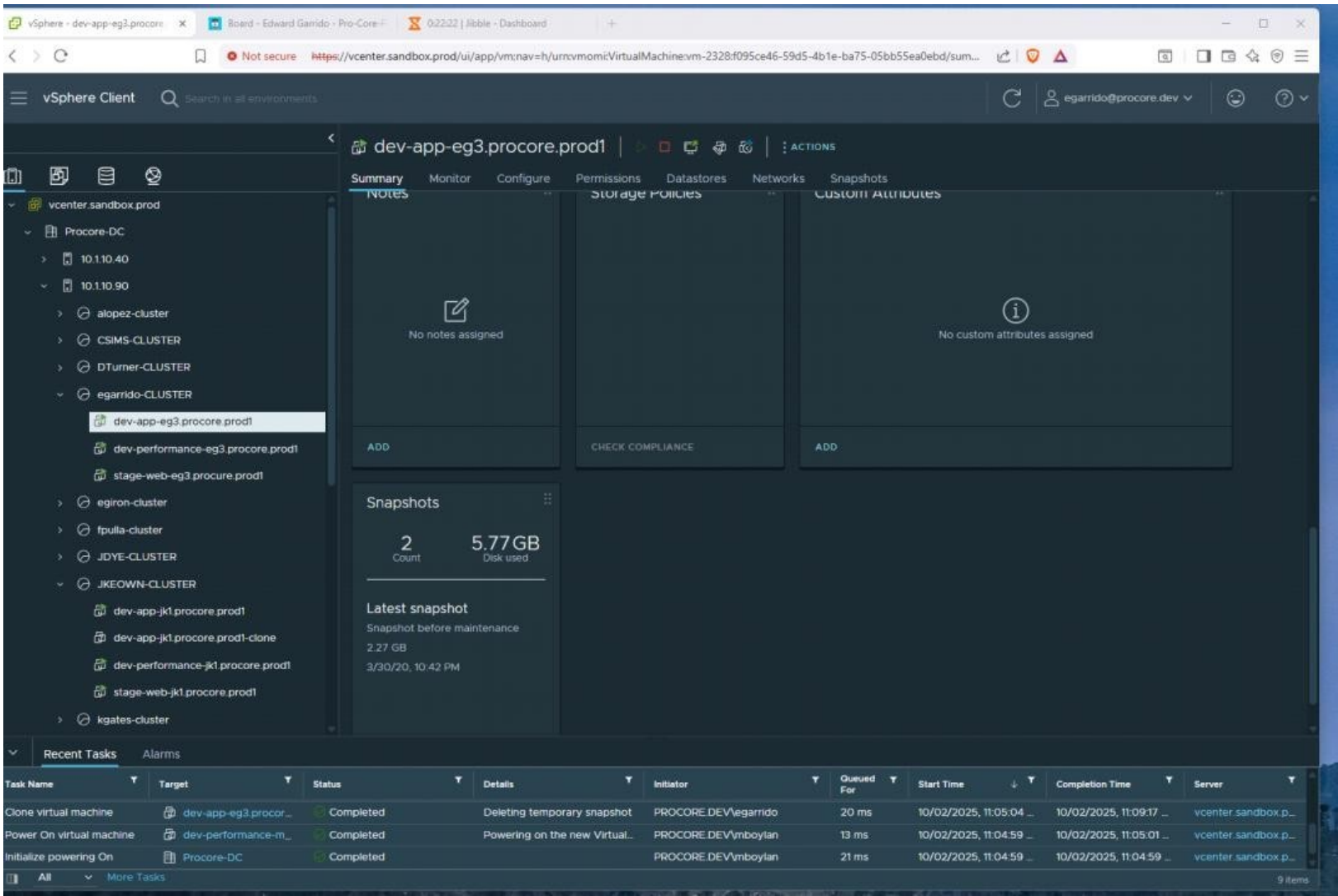
The VMware vSphere Client interface shows the post-deployment state of an application virtual machine within the vCenter environment.

The selected VM appears in the inventory tree under its assigned cluster, with the Summary tab active to display configuration and status information.

Snapshot details are visible, showing the number of snapshots present, disk space consumed, and the most recent snapshot timestamp, indicating snapshot usage around maintenance or deployment activity. Additional panels confirm that no custom attributes or notes are assigned to the virtual machine.

At the bottom of the interface, the Recent Tasks pane confirms successful completion of infrastructure operations, including cloning the virtual machine, powering on the newly created VM, and cleaning up temporary snapshots. Task timestamps, initiators, and completion statuses verify that the clone and startup process completed without errors.

This view confirms that the virtual machine was successfully cloned, initialized, and is now running as expected within the virtualized environment.



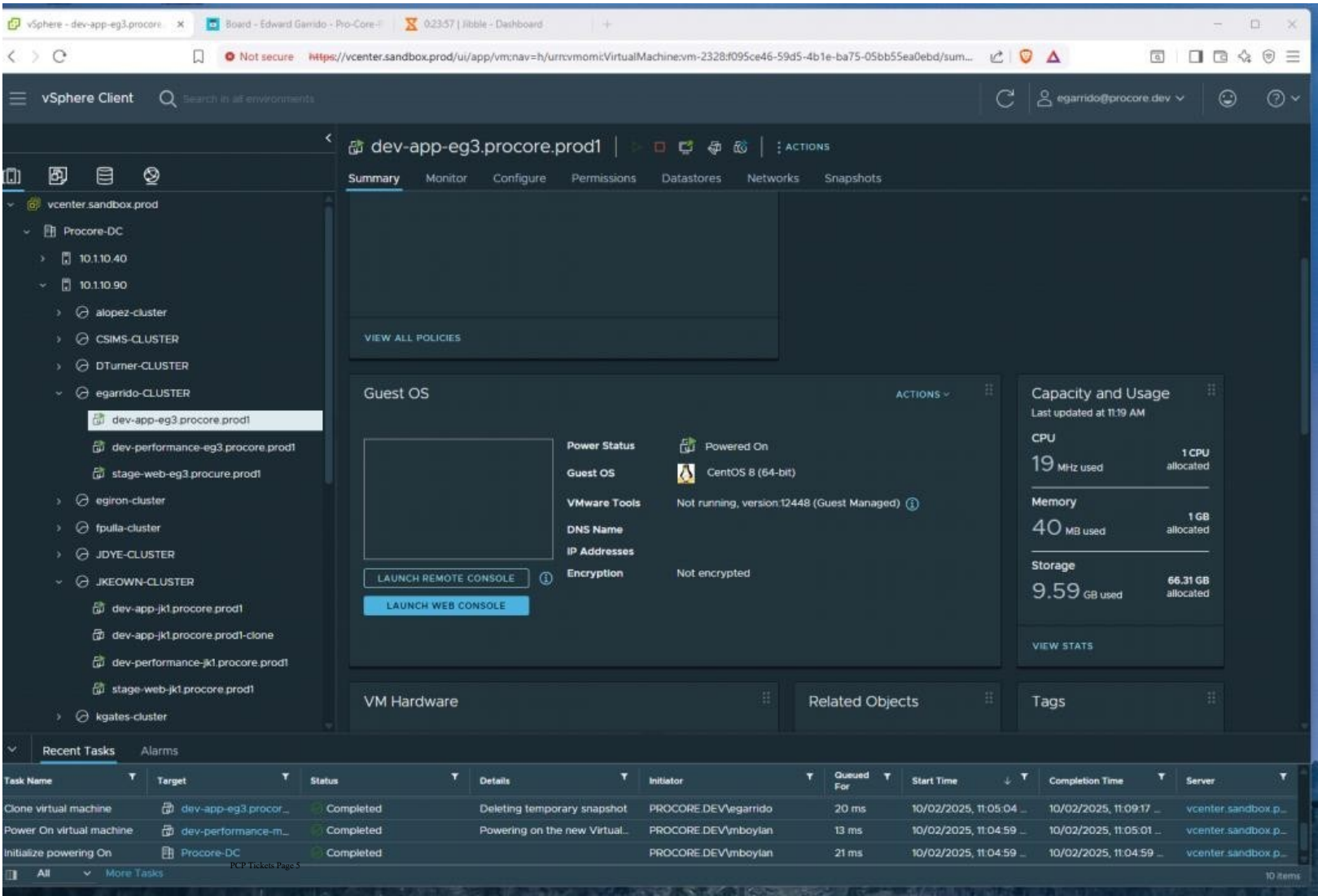
The VMware vSphere Client is showing the Summary view of an application virtual machine after deployment.

The virtual machine is powered on and running CentOS 8 (64-bit), with key guest details displayed including power state, VMware Tools status, DNS configuration, IP addressing, and encryption state.

Resource utilization metrics are visible on the right, providing a real-time snapshot of CPU, memory, and storage usage compared to allocated resources. Action buttons allow direct access to the VM through the web or remote console for administrative tasks.

At the bottom, the Recent Tasks pane confirms successful completion of infrastructure operations, including cloning the virtual machine, powering it on, and removing temporary snapshots created during the process.

This view verifies that the cloned application server is operational, properly resourced, and ready for further configuration or validation within the virtualized environment.

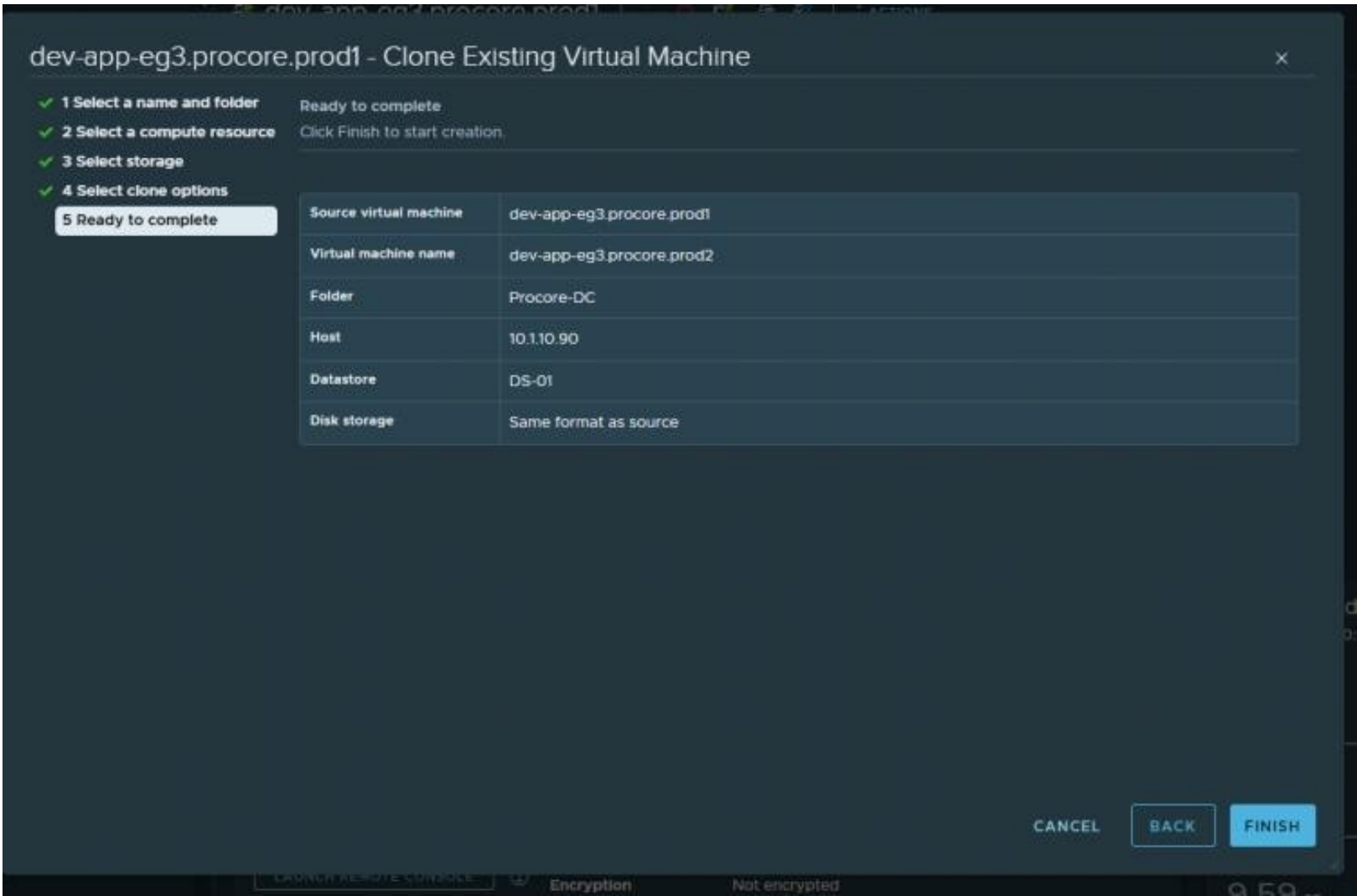


The virtual machine clone workflow is at the Ready to complete stage, presenting a final configuration summary before deployment.

The source virtual machine is identified along with the new VM name, confirming that the clone will be created from the correct application server.

Deployment details show the selected datacenter and folder, the destination ESXi host providing compute resources, and the datastore assigned for storage. Disk provisioning is set to use the same format as the source virtual machine, ensuring consistency with the existing configuration.

This final review step allows verification of naming, placement, compute, and storage selections before initiating the clone operation and completing the virtual machine creation process.

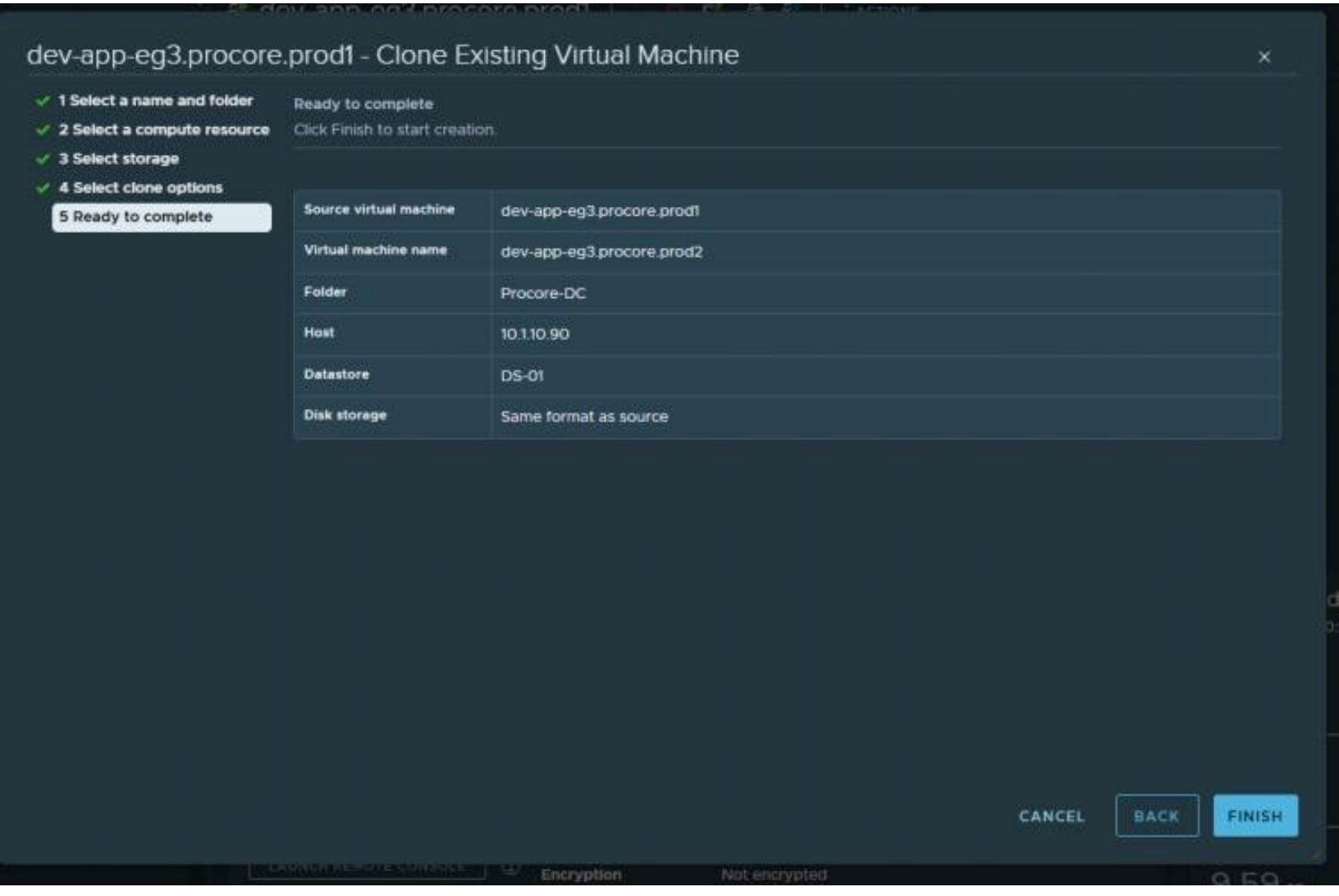


The virtual machine cloning process is at the Ready to complete step, where all selected configuration details are summarized prior to execution.

The source virtual machine is confirmed, and the new virtual machine name is defined to ensure correct identification within the vCenter inventory.

The summary verifies the destination datacenter and folder, the selected ESXi host providing compute resources, and the datastore assigned for virtual disk storage. Disk provisioning is configured to use the same format as the source virtual machine, maintaining consistency with the existing deployment.

This final review stage acts as a validation checkpoint, ensuring compute, storage, and placement selections are accurate before initiating the clone and completing the virtual machine creation.

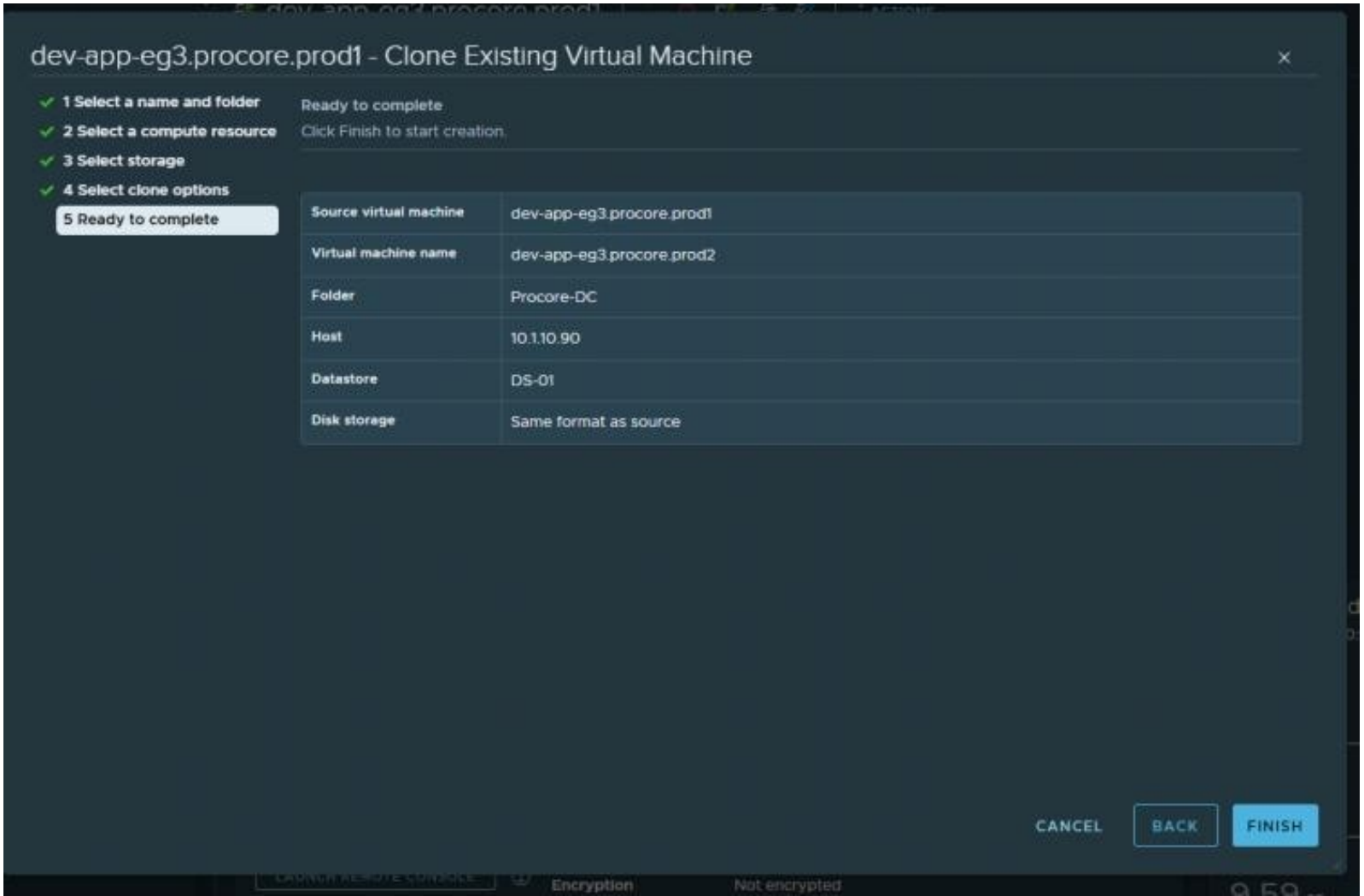


The virtual machine cloning workflow is at the Ready to complete stage, where all configuration choices are summarized before execution.

The source application server is identified, and the new virtual machine name is confirmed to ensure correct inventory placement.

The summary verifies the selected datacenter and folder, the destination ESXi host supplying compute resources, and the datastore assigned for virtual disk storage. Disk provisioning is configured to match the source virtual machine, maintaining consistency in storage format and layout.

This final confirmation step provides an opportunity to validate naming, compute, and storage selections before initiating the clone and completing the virtual machine creation process.



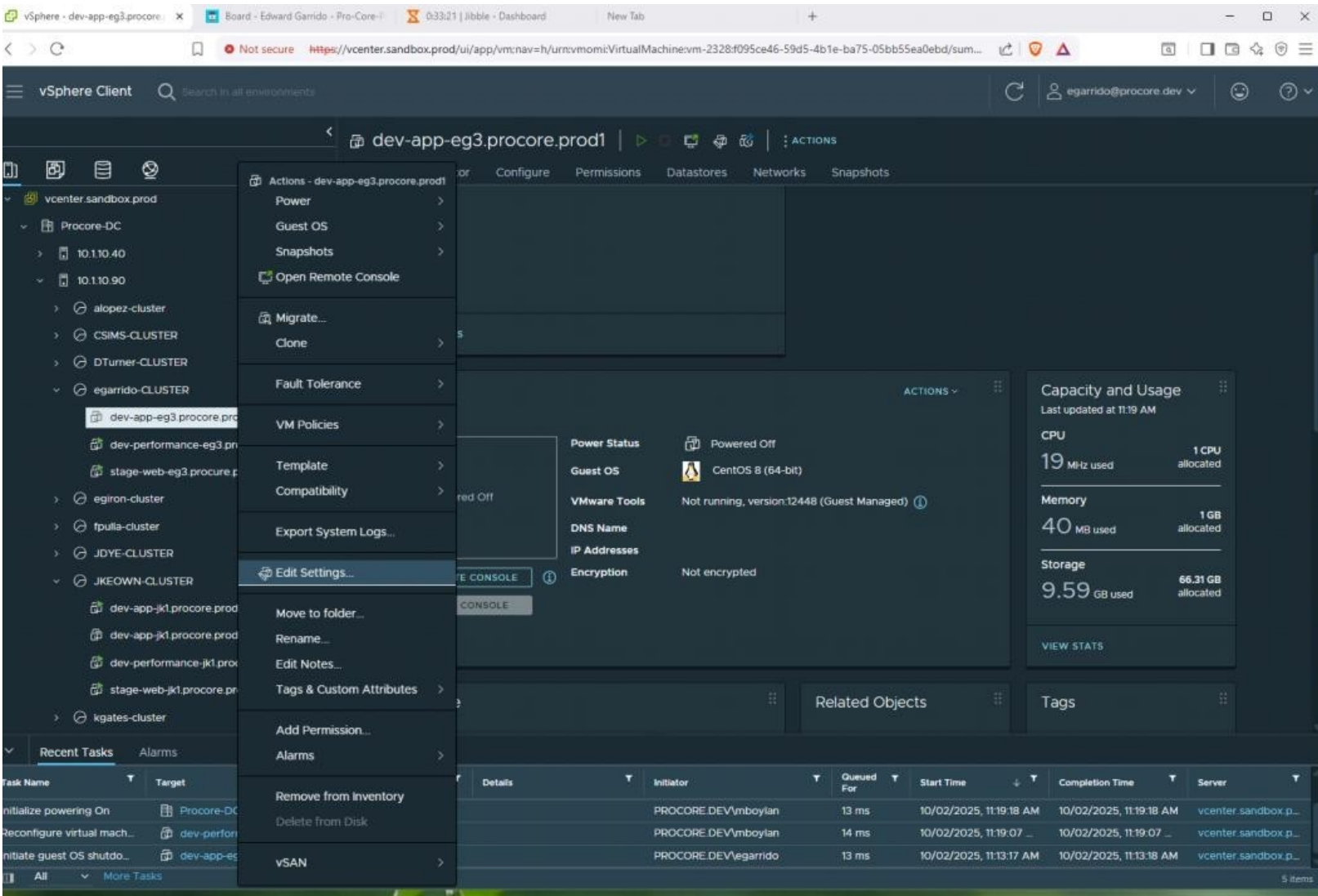
The VMware vSphere Client interface is being used to manage an application virtual machine within a vCenter environment.

The Actions menu for the selected virtual machine is open, exposing administrative options such as power operations, guest OS actions, snapshot management, cloning, migration, template management, compatibility checks, and exporting system logs.

The summary panel shows the current state of the virtual machine, including power status, guest operating system version, VMware Tools state, DNS and IP information, and encryption status. Resource utilization metrics for CPU, memory, and storage are displayed to the right, providing visibility into current capacity and usage.

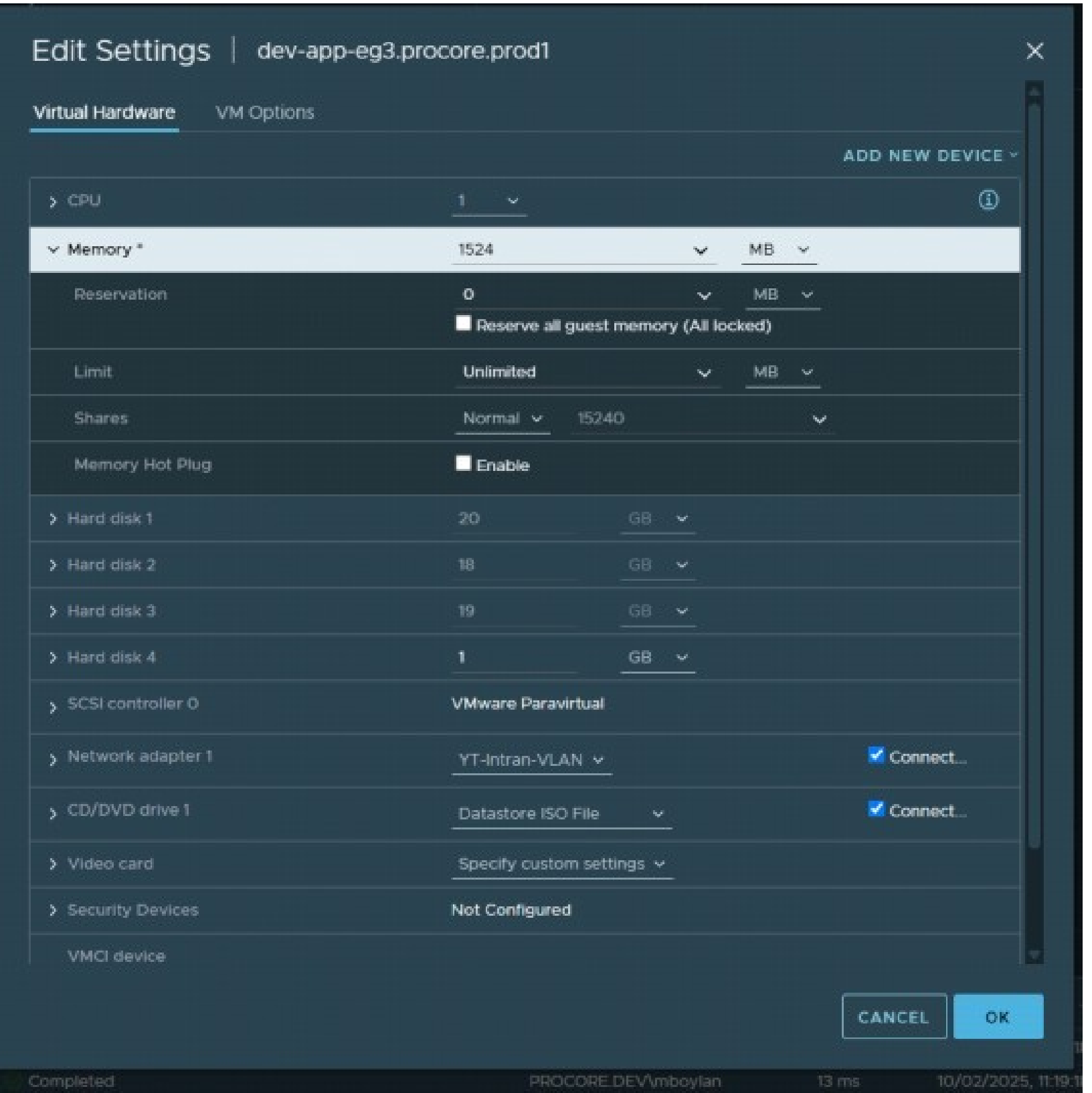
The recent tasks pane at the bottom confirms completed operations related to virtual machine lifecycle management, such as reconfiguration and power state changes.

This view highlights day-to-day infrastructure administration tasks performed through VMware vSphere for managing virtual machines in an enterprise environment.

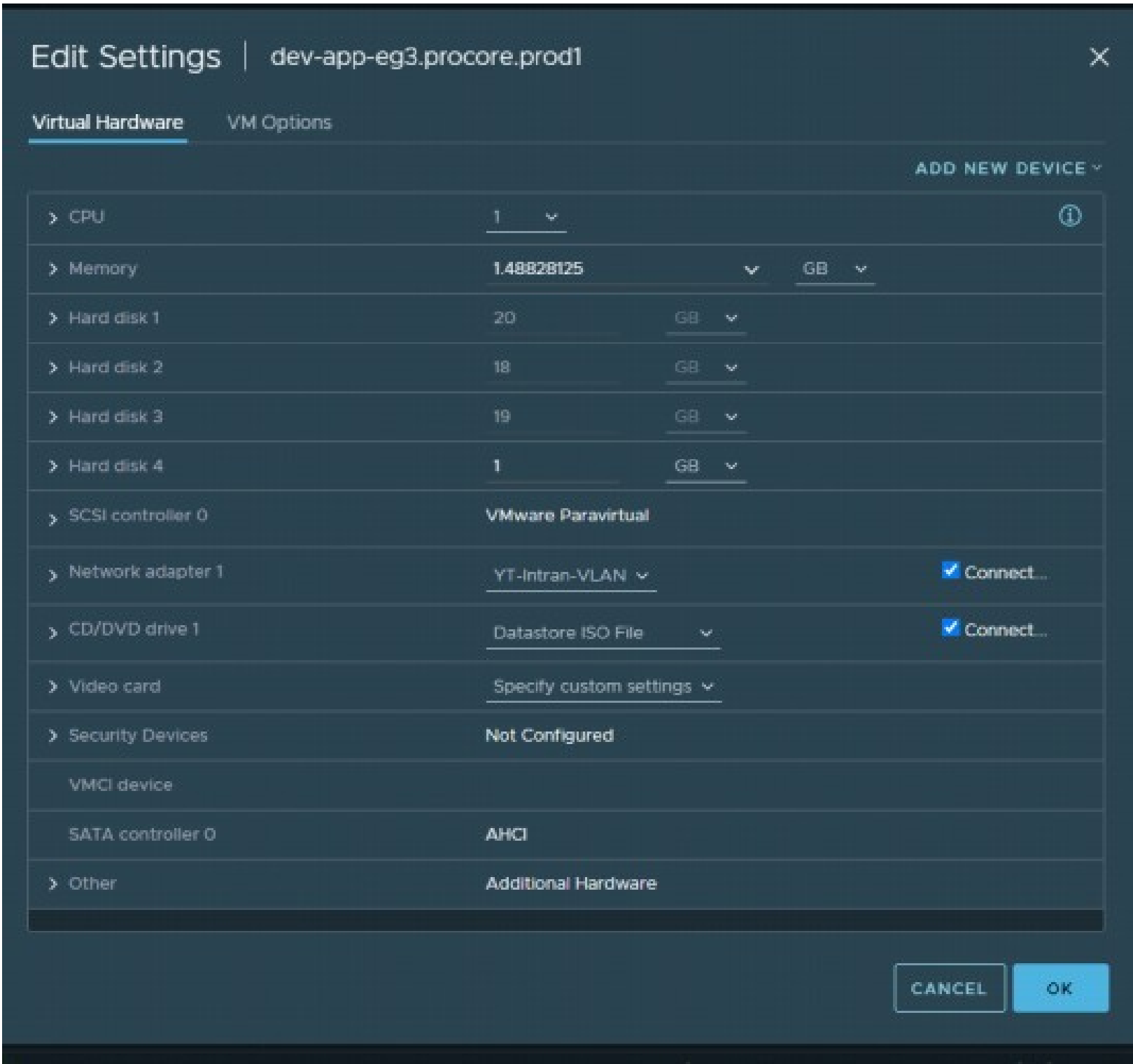


The virtual machine’s Edit Settings panel is open in VMware vSphere, showing virtual hardware configuration.

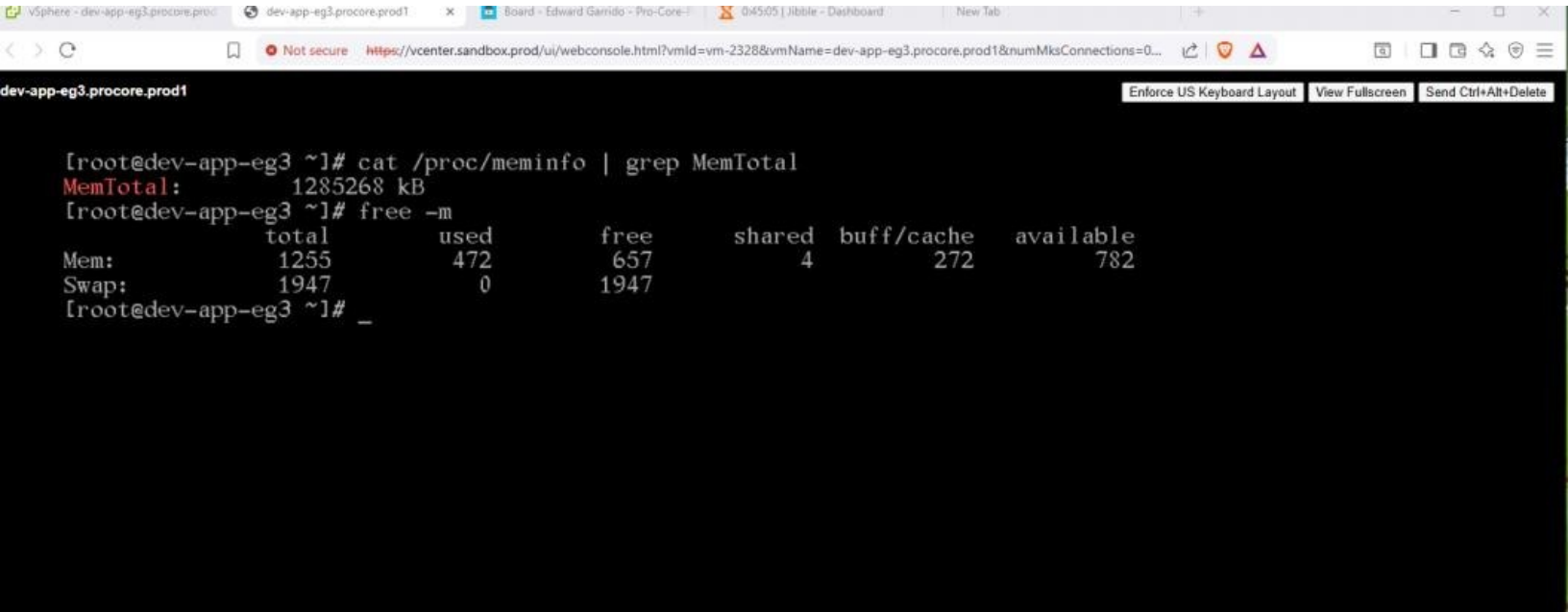
Memory is set to 1524 MB, CPU allocation is defined, multiple virtual disks are attached, and the network adapter is connected to the designated VLAN, confirming resource and connectivity settings.



The VMware vSphere Edit Settings view shows the virtual machine’s hardware configuration, including 1 vCPU, approximately 1.5 GB of memory, multiple attached virtual disks, and a network adapter connected to the assigned VLAN.



The Linux command output confirms the virtual machine’s memory allocation and usage, showing approximately 1.25 GB of total RAM with available memory and active swap space, verifying that the updated memory configuration is recognized by the operating system.



Summary

The recent work covers end-to-end Linux infrastructure operations in a virtualized enterprise environment. Tasks include filesystem management, system maintenance, virtualization lifecycle operations, and centralized log monitoring across application and web servers.

Linux administration activities focus on creating and validating symbolic links, verifying system memory and resource allocation, and performing controlled package upgrades involving core libraries and database services. All changes are validated at the operating system level to ensure stability and consistency.

Virtual machine management is performed using VMware vSphere, including cloning existing application servers, selecting compute and storage resources, configuring virtual hardware, and confirming successful deployment through post-clone verification. Resource changes such as memory updates are applied and validated both at the hypervisor and guest OS levels.

Centralized logging is leveraged through Graylog to monitor real-time and historical system activity. Log analysis captures authentication events, service lifecycle changes, application errors, and Filebeat log shipping behavior, supporting troubleshooting, auditing, and operational visibility.

Together, these tasks demonstrate hands-on experience with Linux system administration, VMware virtualization, configuration verification, and observability practices in a production-like environment.