
AWS
re:Invent
NOV. 28 – DEC. 2, 2022 | LAS VEGAS, NV

CMP404

AWS Nitro: Enhancing security and future-proofing your instances

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EC2 Compute
AWS

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Software Development Manager
EC2, Kernel and OS
AWS

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Agenda



Xen hypervisor

AWS Nitro System

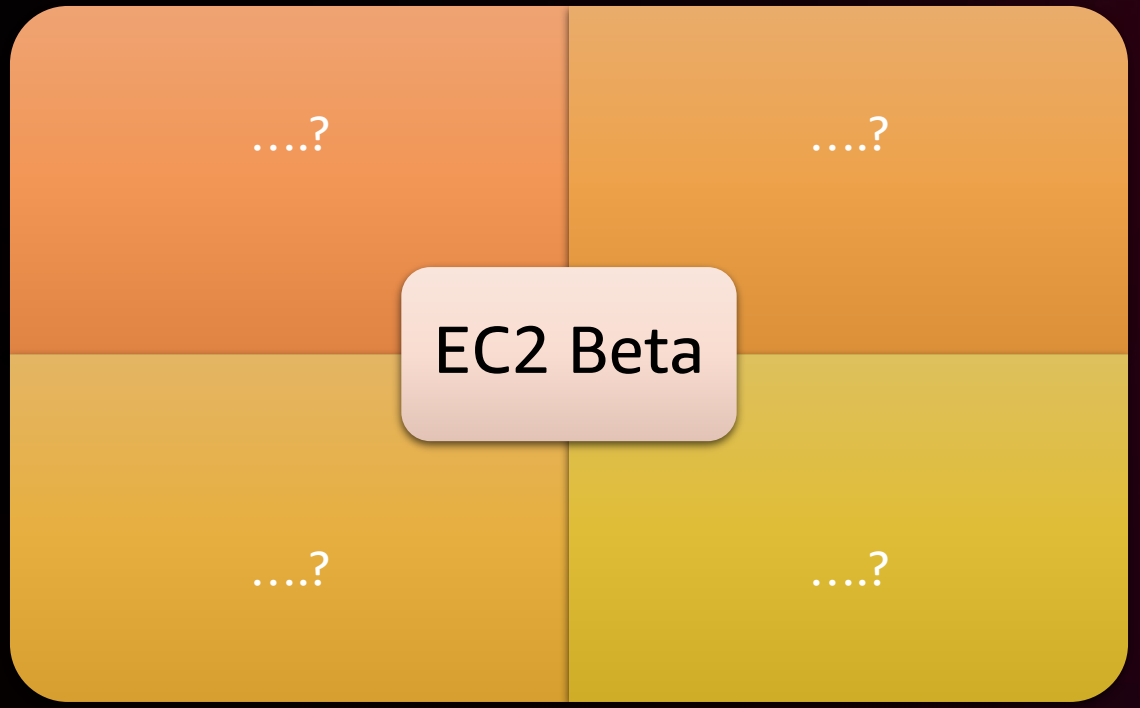
Our approach to previous generation instances

Running Xen Instances on the AWS Nitro System

Q&A

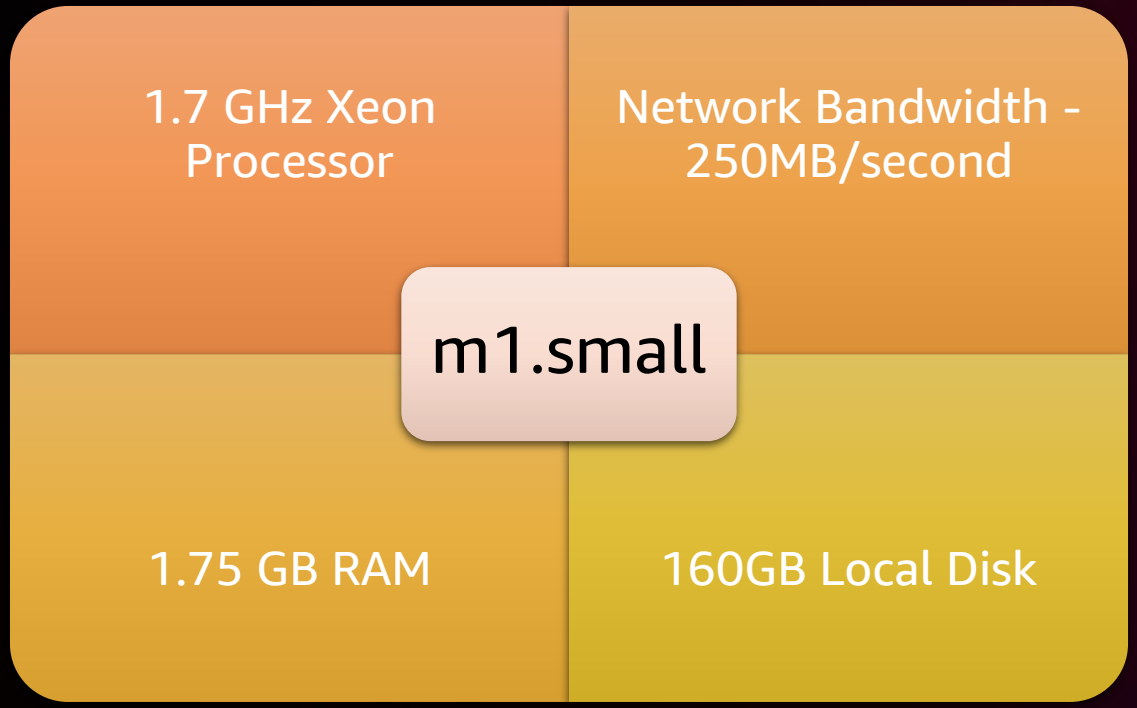
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EC2’s 1st instance launched in…?



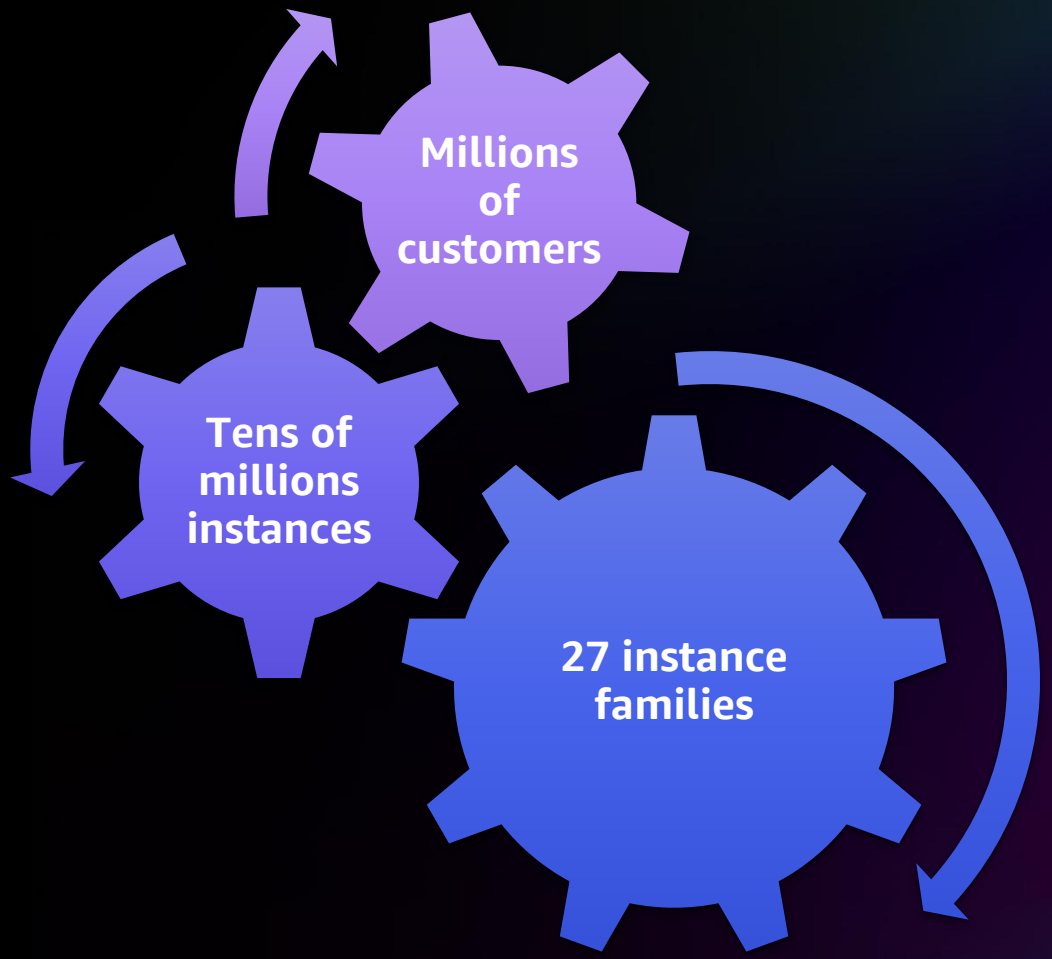
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m1.small – EC2's 1st instance launched in 2006



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Xen Hypervisor



Support for many **popular EC2 instance families** including CMR4, T2, I2, I3, X1, X1e, P2, P3, and more

Para-virtualized network and storage devices initially without HW acceleration

Xen presented us with **challenges** as we looked to scale

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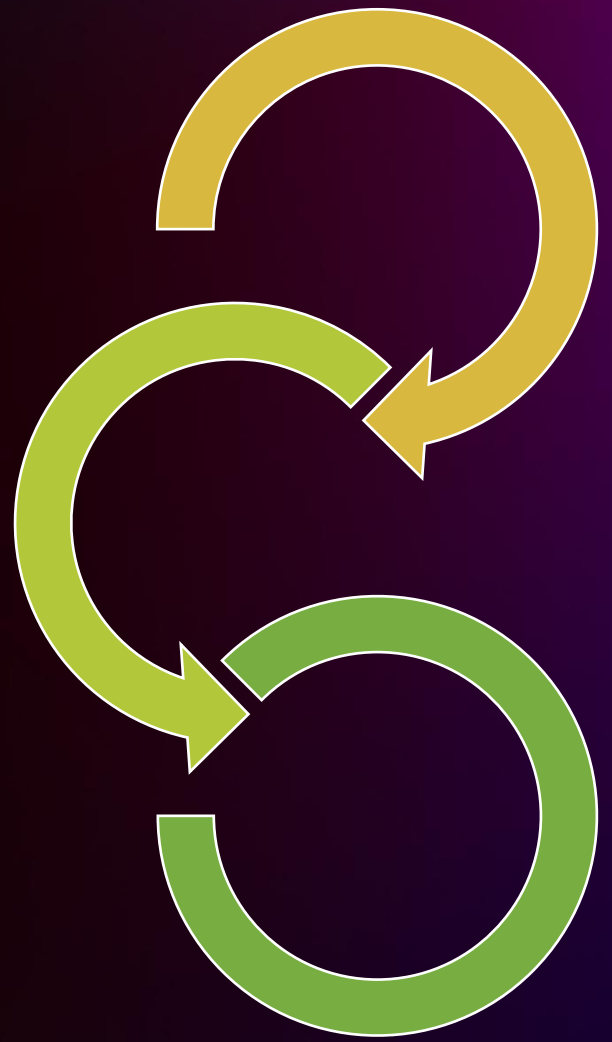
Customer feedback

1. Customers are **focused on creating new products** and services for their customers, not upgrading infrastructure for existing applications

2. **Dependencies on legacy operating systems or software** that are incompatible or not qualified with modern hardware

3. The **engineering resources** required to plan, test, qualify, and prioritize the migration of stable profit generating applications

4. Concerned with service **deprecation announcements** across the industry



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How can we work backwards to support our customers who continue to run and scale their exiting workloads in EC2?

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The AWS Nitro System architecture

OFFERING THE BEST SECURITY, PERFORMANCE, AND INNOVATION IN THE CLOUD



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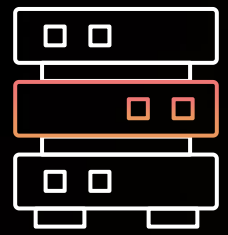
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NEW!

INTRODUCING

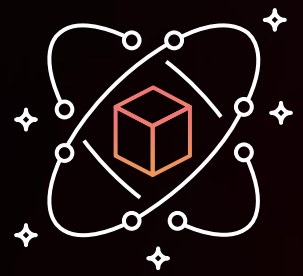
Long-term support for previous generation instances

SUPPORT FOR XEN-BASED EC2 INSTANCES ON THE NITRO SYSTEM



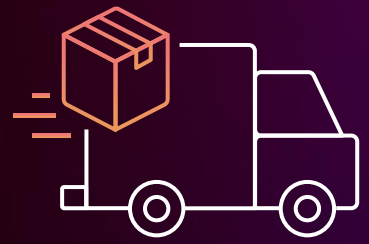
EXTENDED LIFETIME

Run your workloads on the instances they were built on for years to come



NITRO BENEFITS

Enhanced security, scalability, and elasticity provided by the AWS Nitro System



SEAMLESS MIGRATION

Seamless transition to the AWS Nitro System with instance specifications, AMIs, and workflows remaining the same

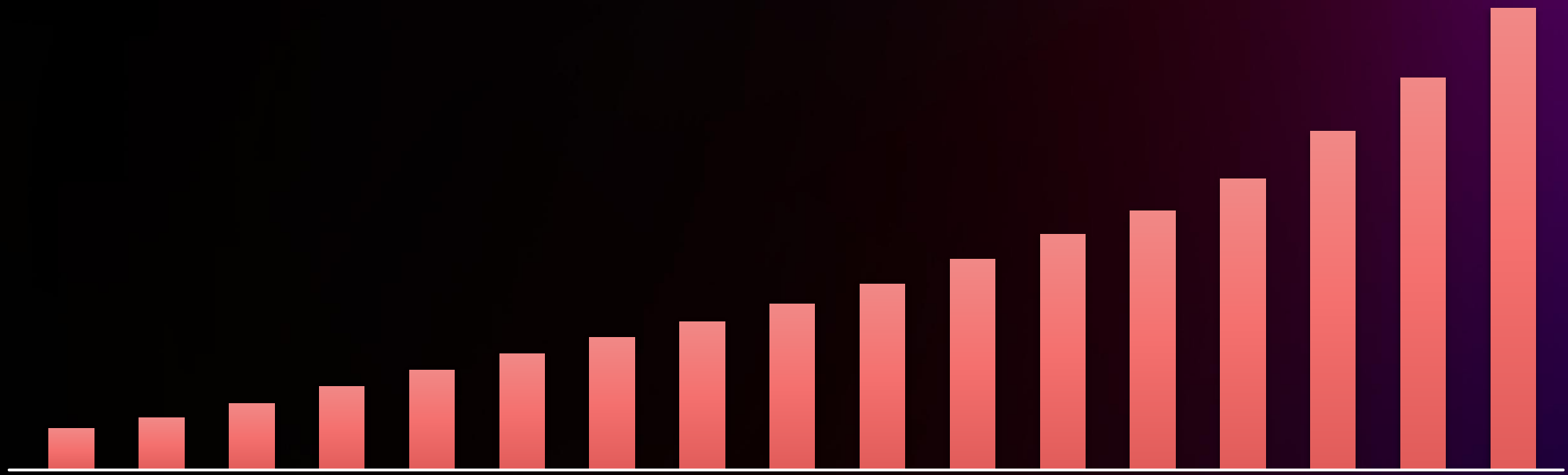
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Long-term support for previous generation instances

SUPPORT FOR XEN-BASED EC2 INSTANCES ON THE NITRO SYSTEM

175K+
instance launches



November 2022

- The first wave of previous generation instances we are enabling on Nitro includes M3, M2, and M1 (in 2022) with support for additional EC2 instance families coming soon
- Seamless transition with workflows remaining the same

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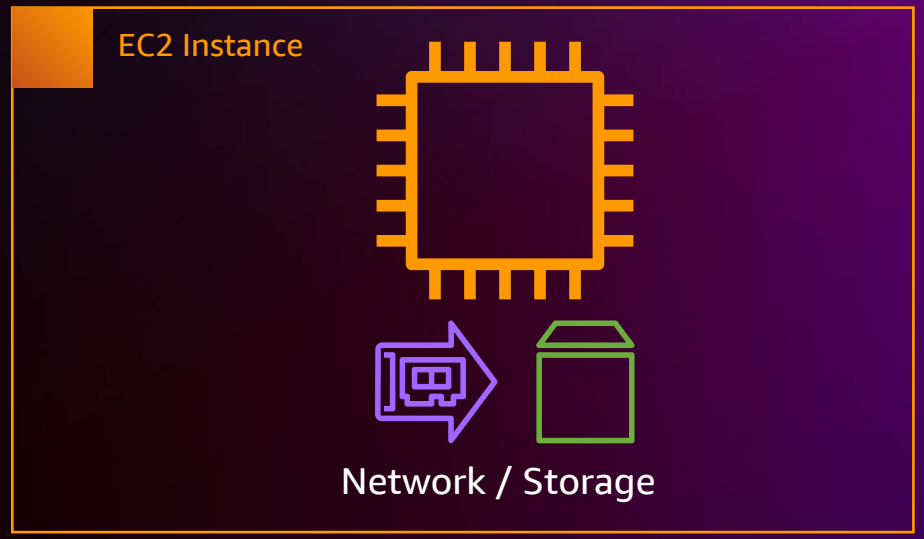
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LIVE

AWS Nitro System

A combination of dedicated hardware and lightweight hypervisor enabling faster innovation and enhanced security

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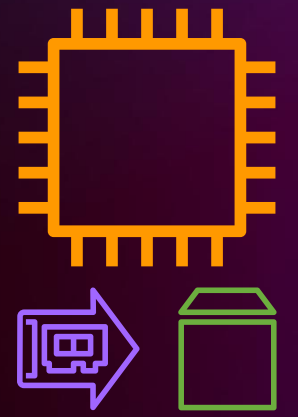


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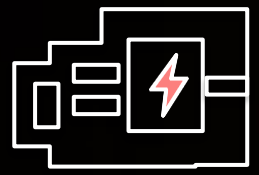
Nitro VMM

2

Nitro Instance



Network / Storage



Nitro Card

KVM

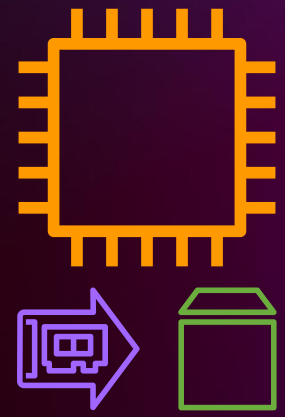
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Nitro VMM

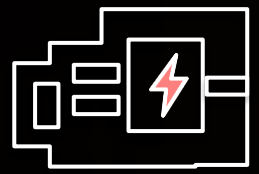
Nitro Instance



ENA / NVMe

VMM instructs KVM to *pass through* devices from the Nitro Card to the instance

KVM



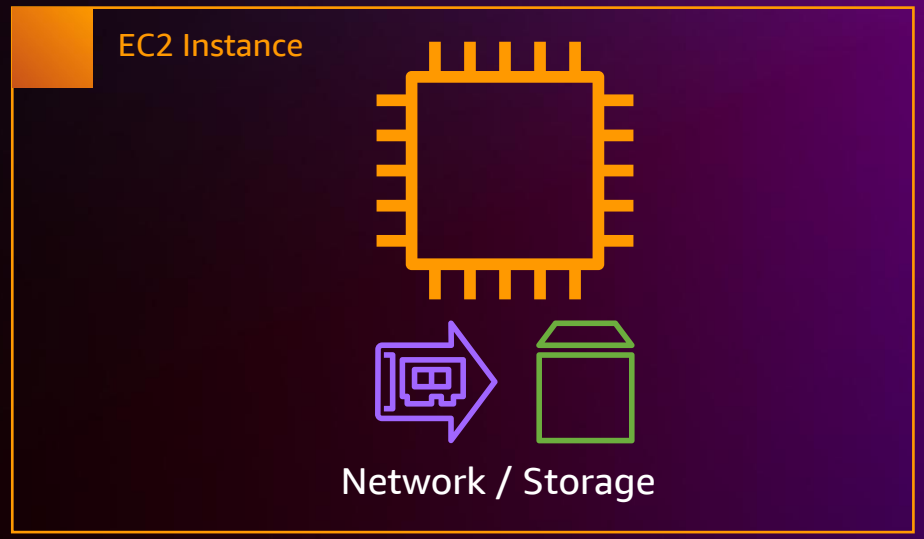
Nitro Card

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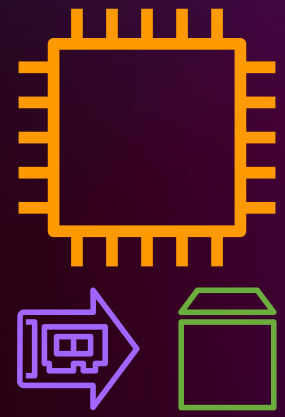
Xen hypervisor

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Xen Instance



Paravirtual (PV) devices

Xen

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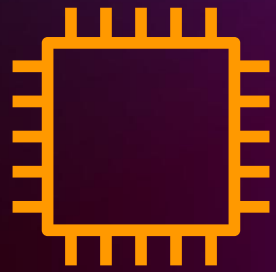
Dom0



2 PV Backend

Split driver model

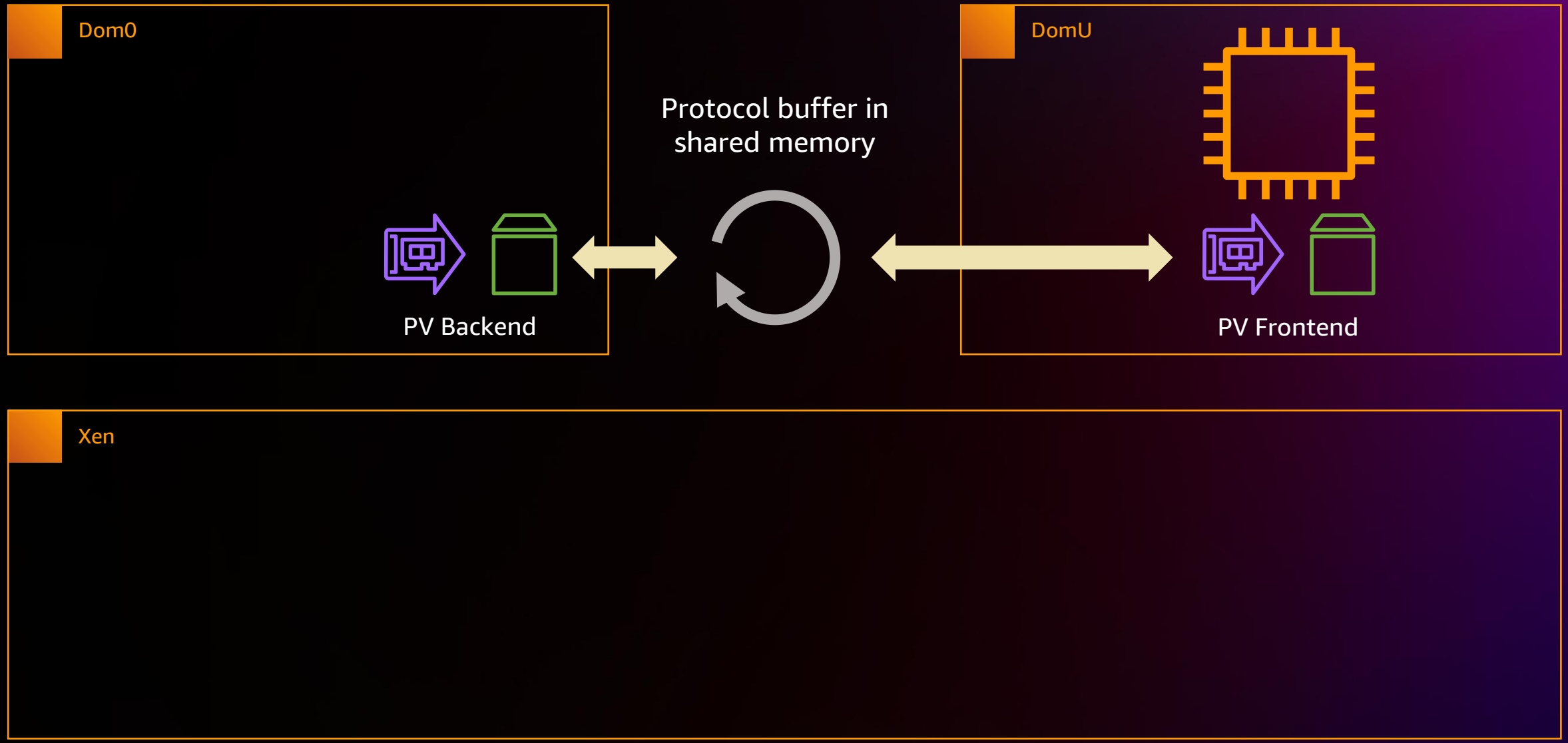
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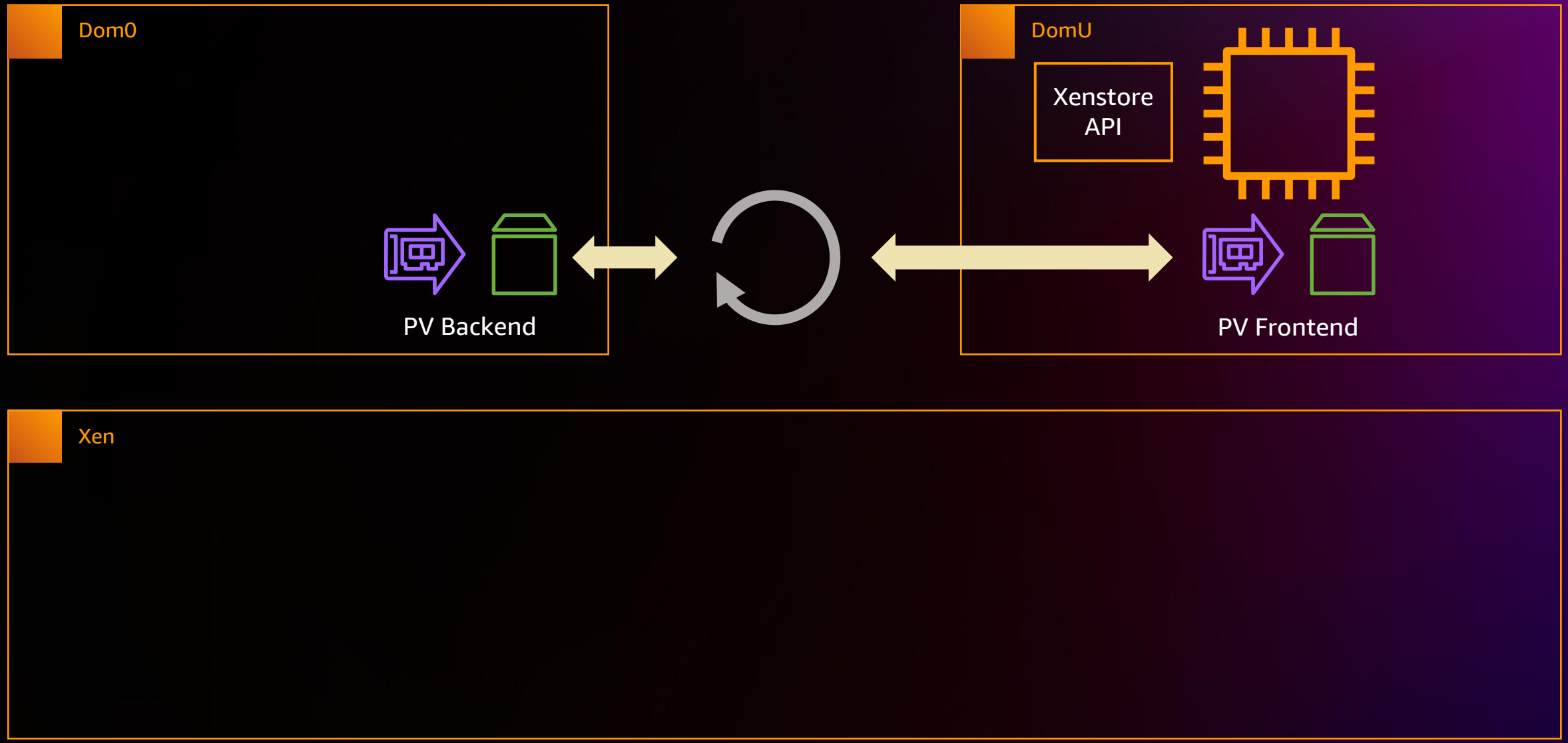
1 PV Frontend

Xen

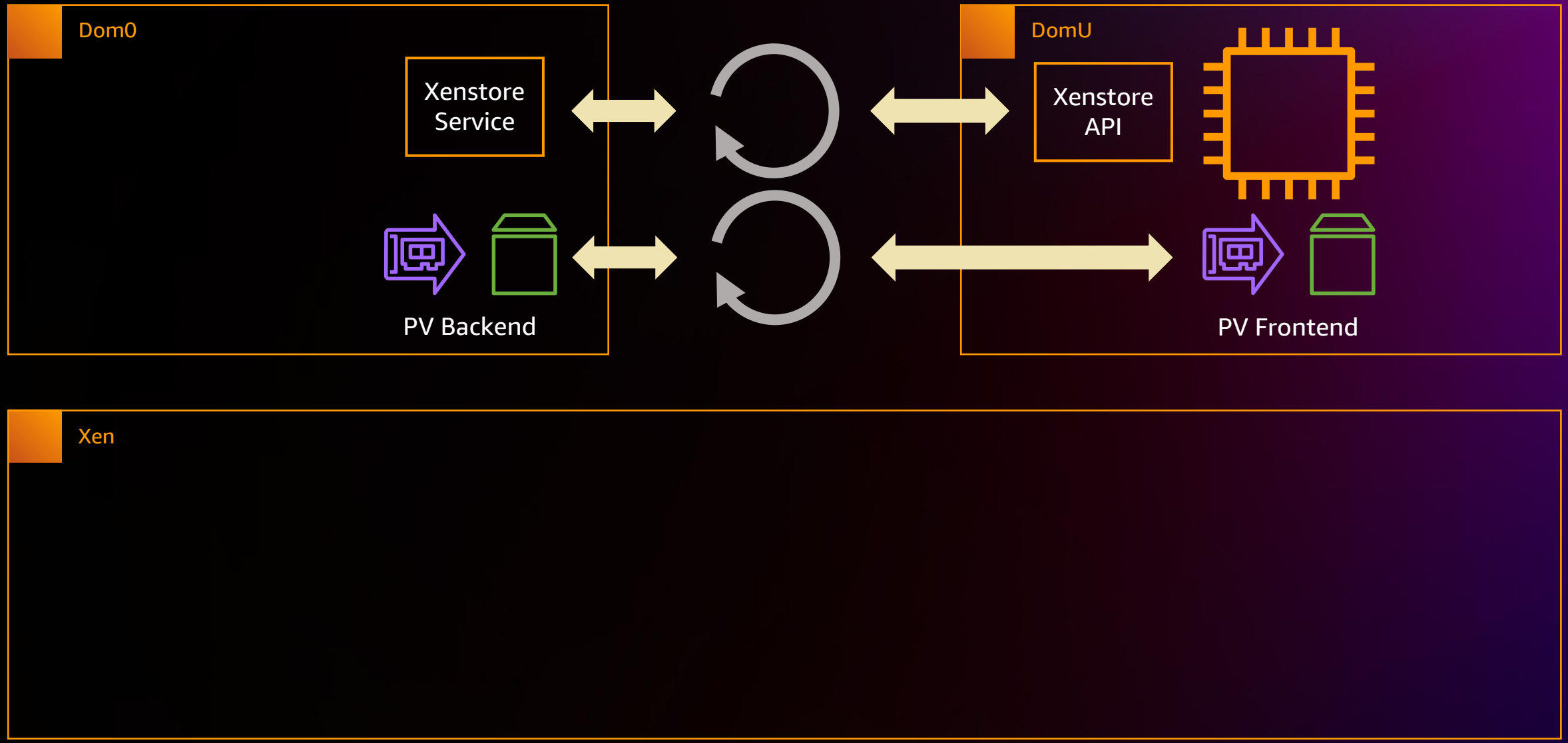
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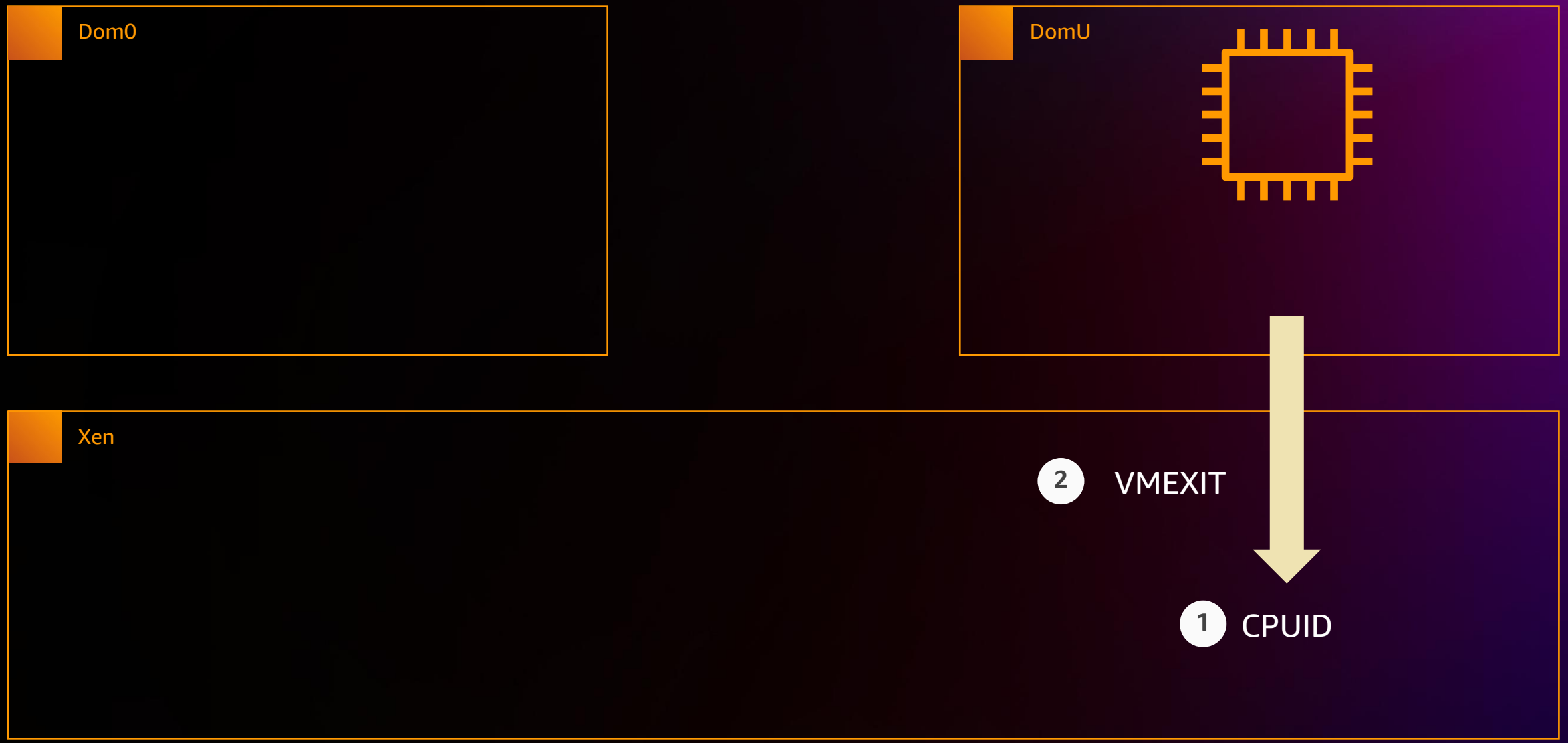
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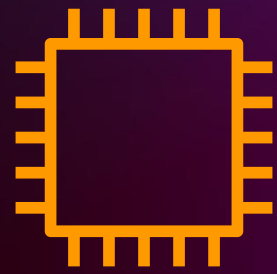
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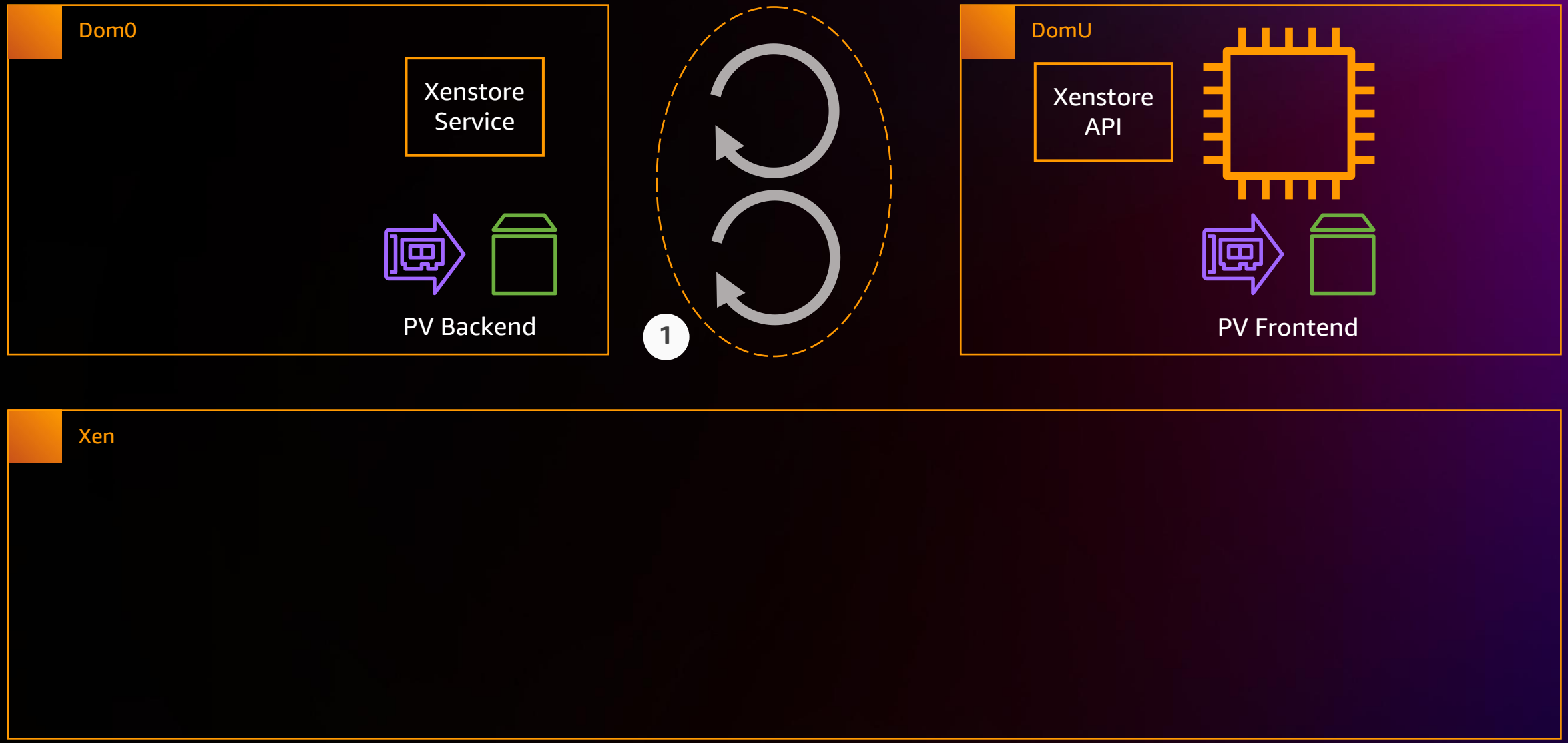
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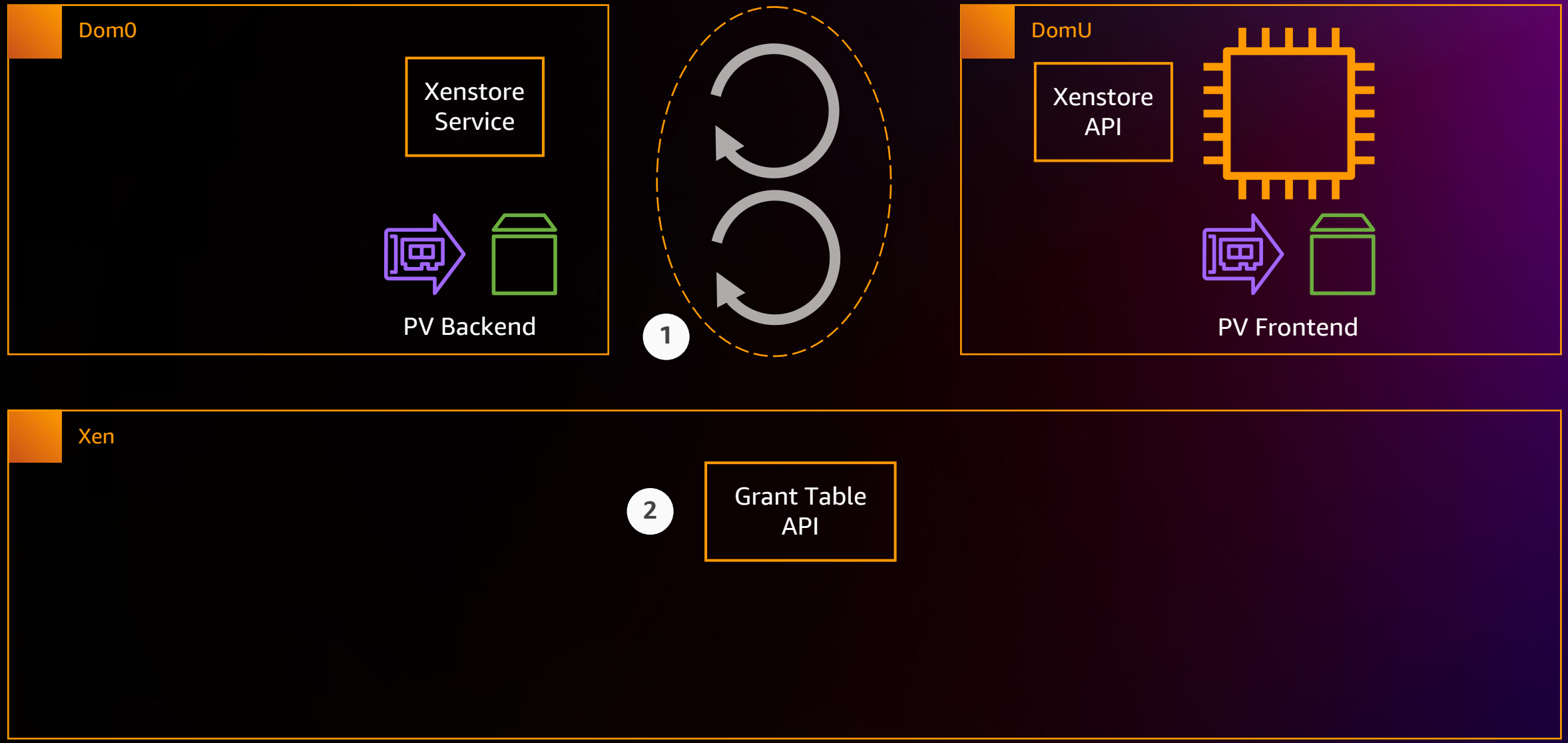
Xen

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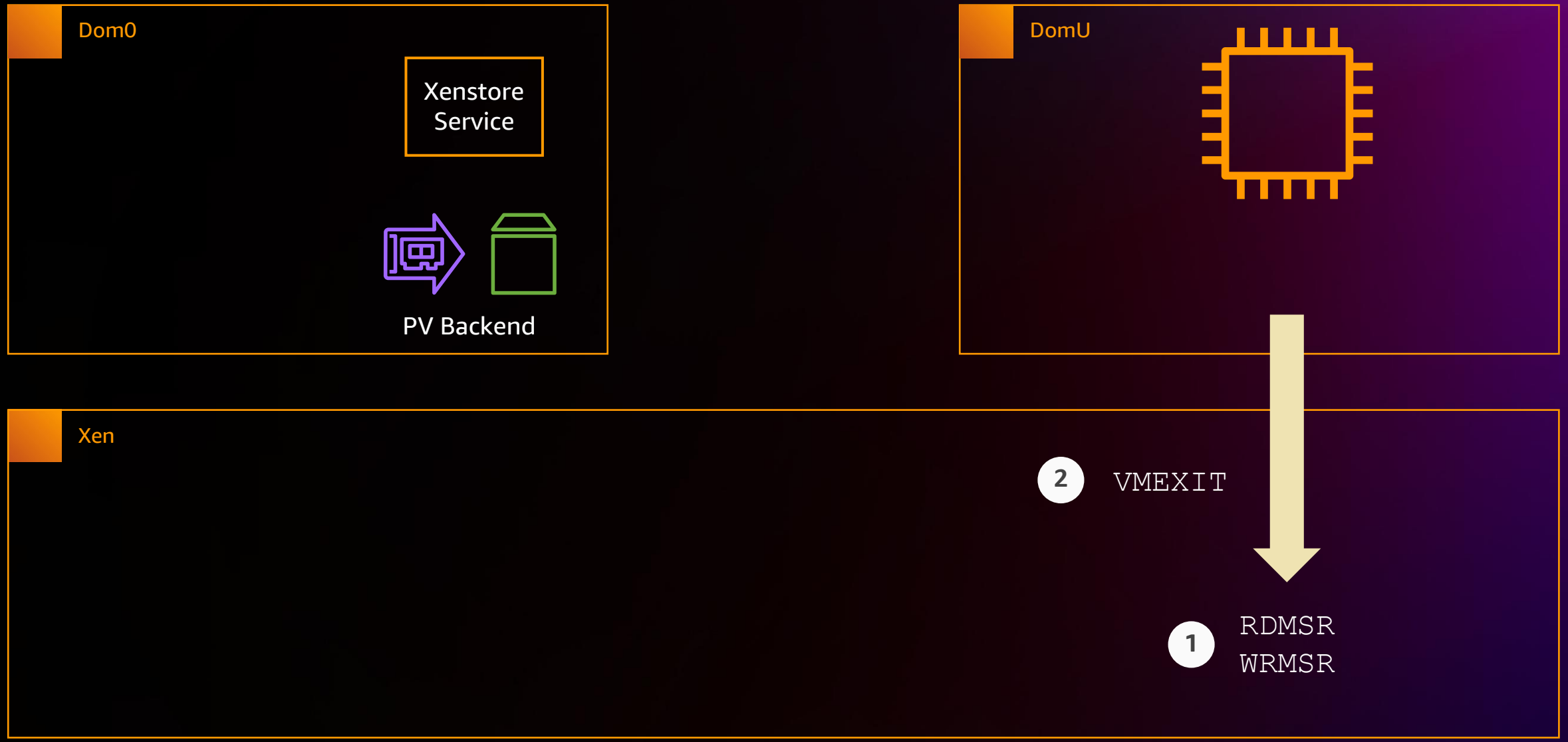
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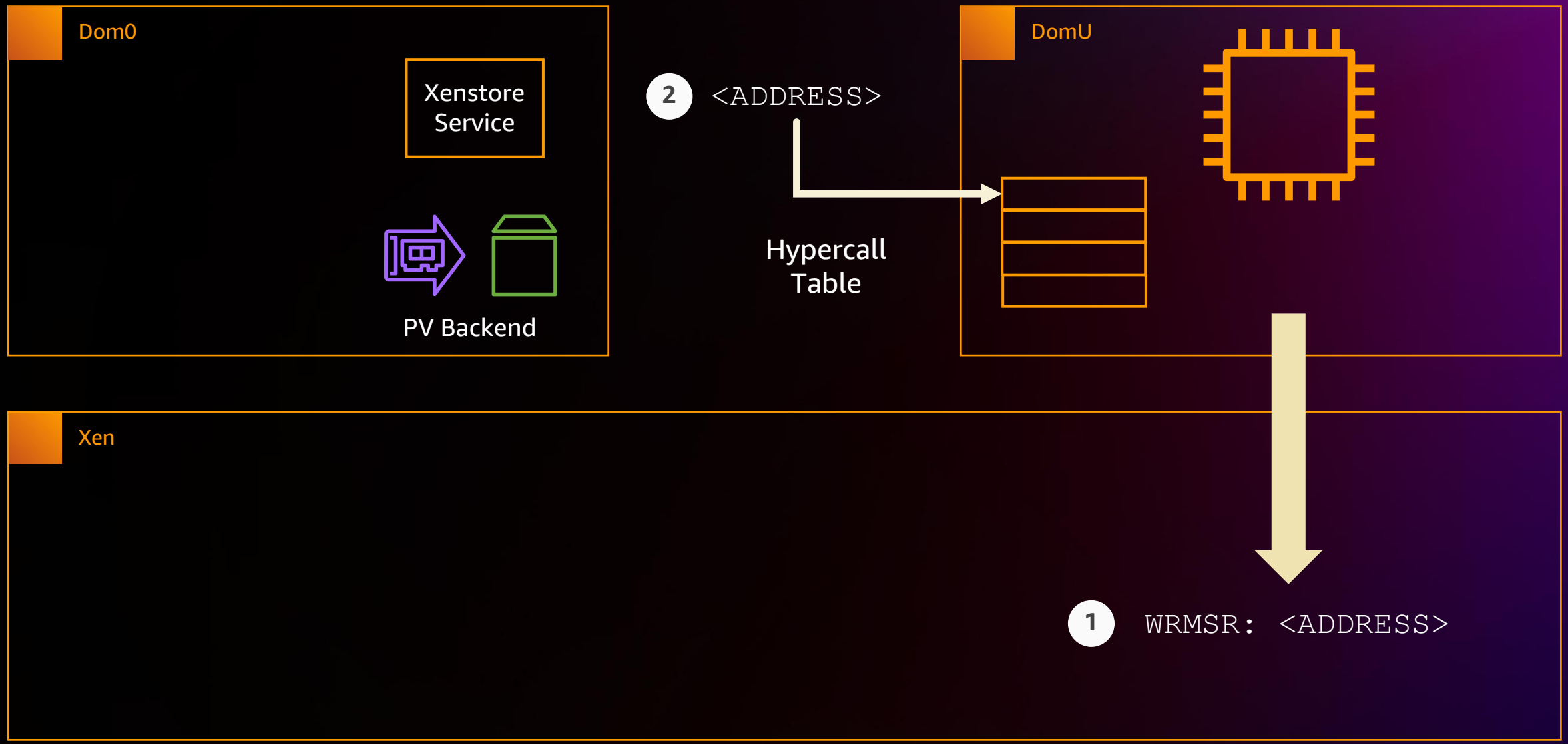
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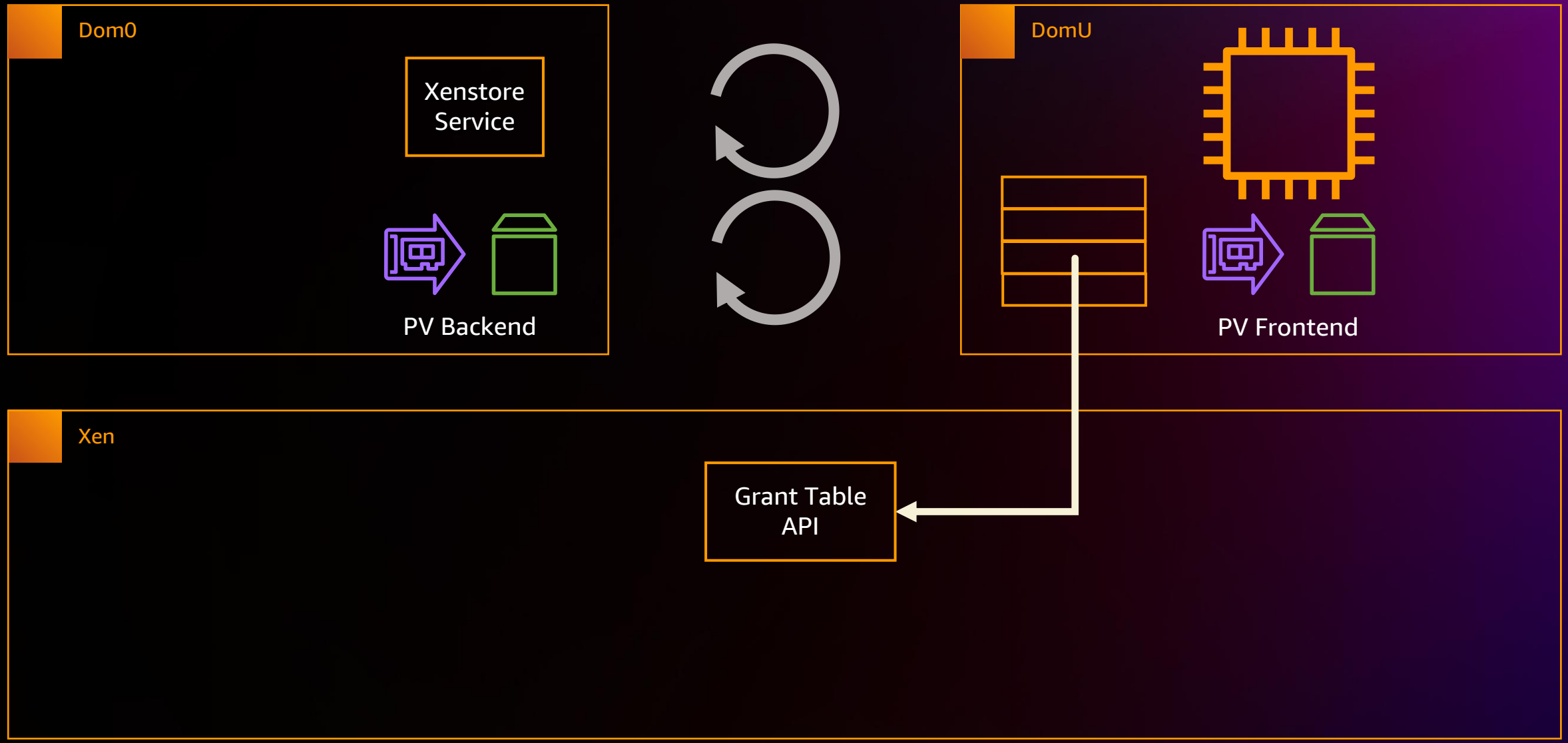
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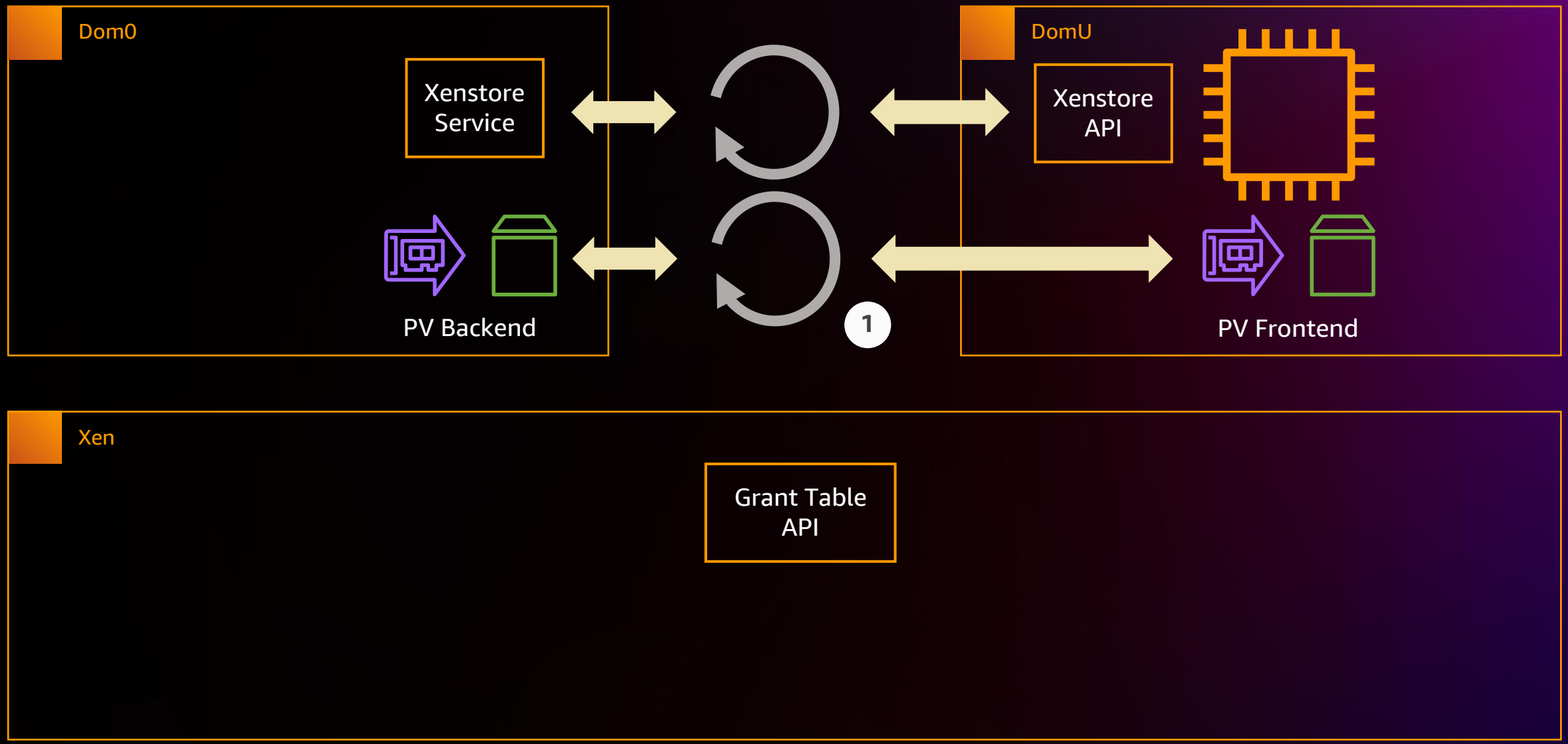
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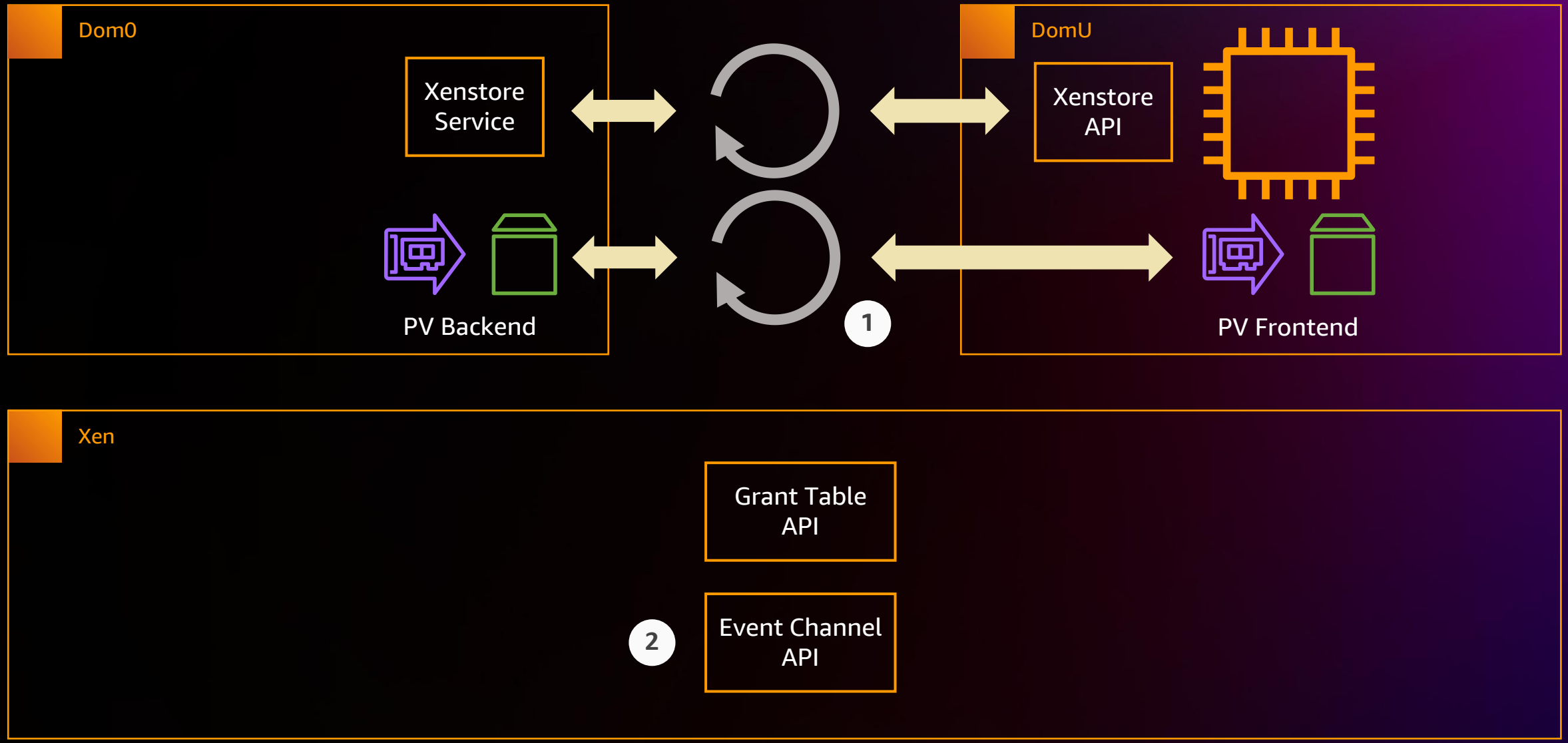
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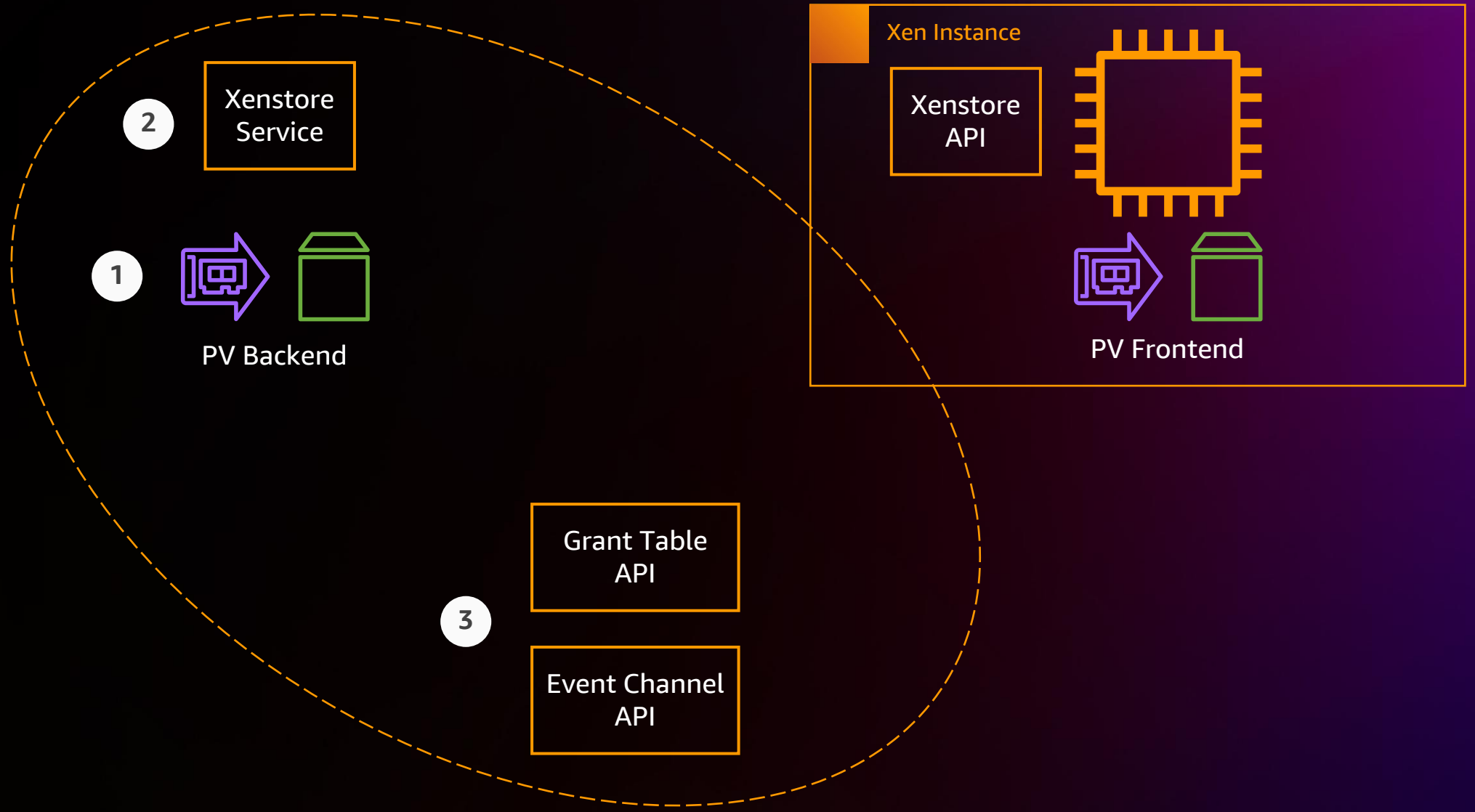
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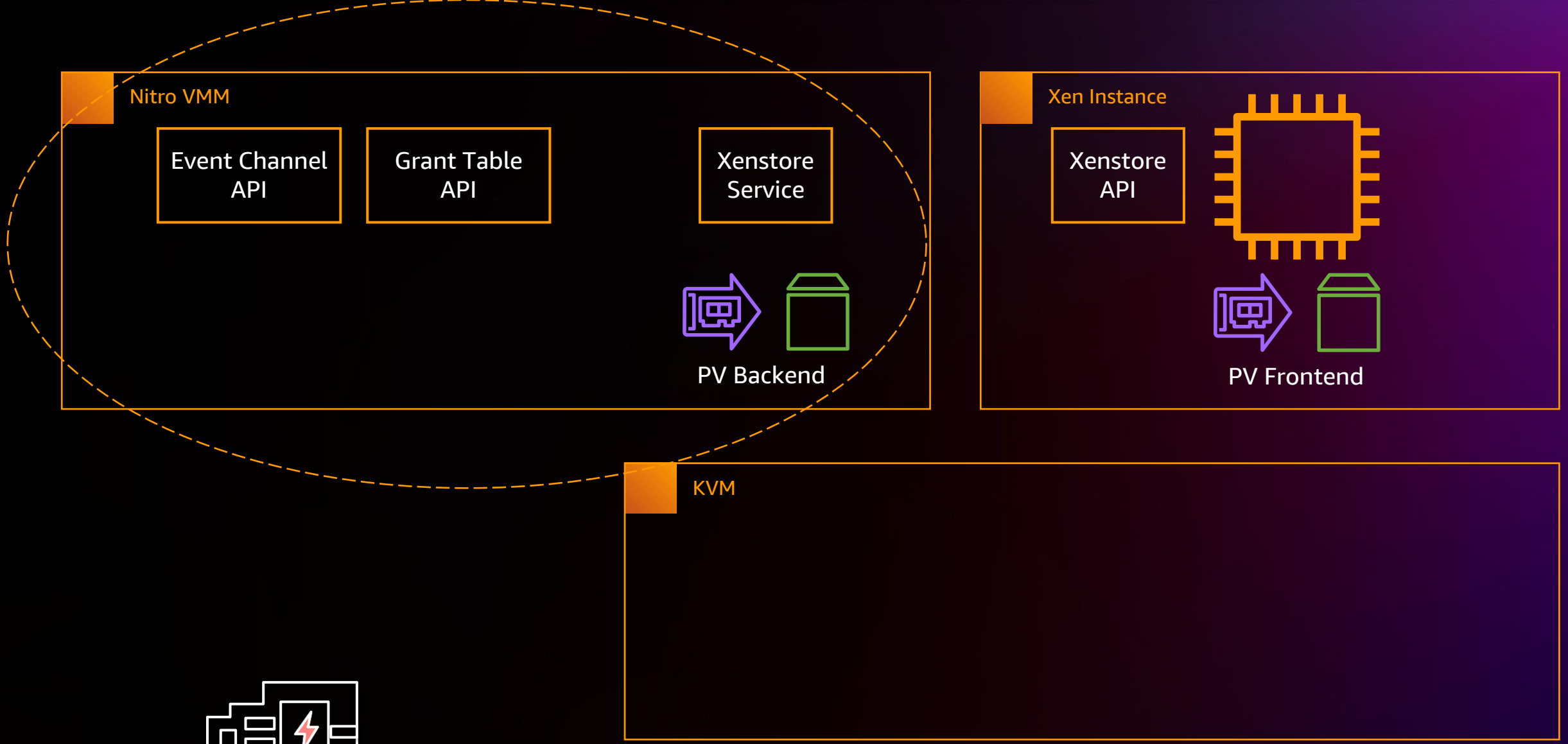
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Xen instances on the Nitro System

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Nitro Card

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Nitro VMM

Event Channel API

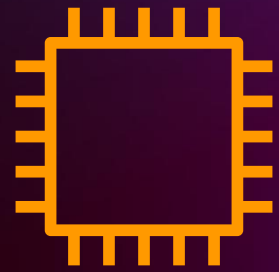
Grant Table API

Xenstore Service



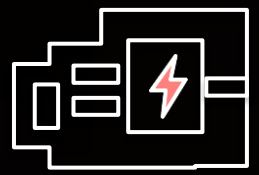
PV Backend

Xen Instance



KVM

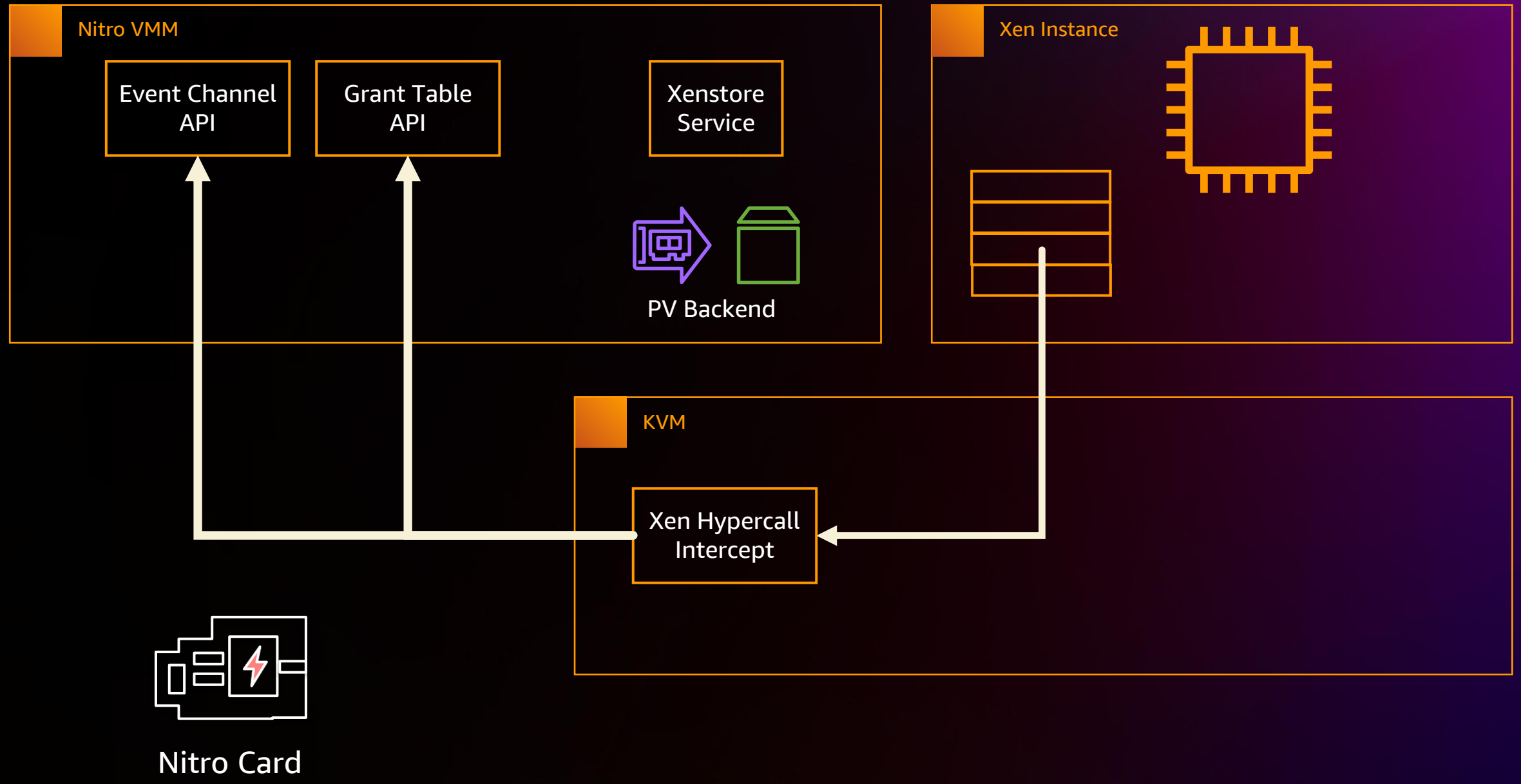
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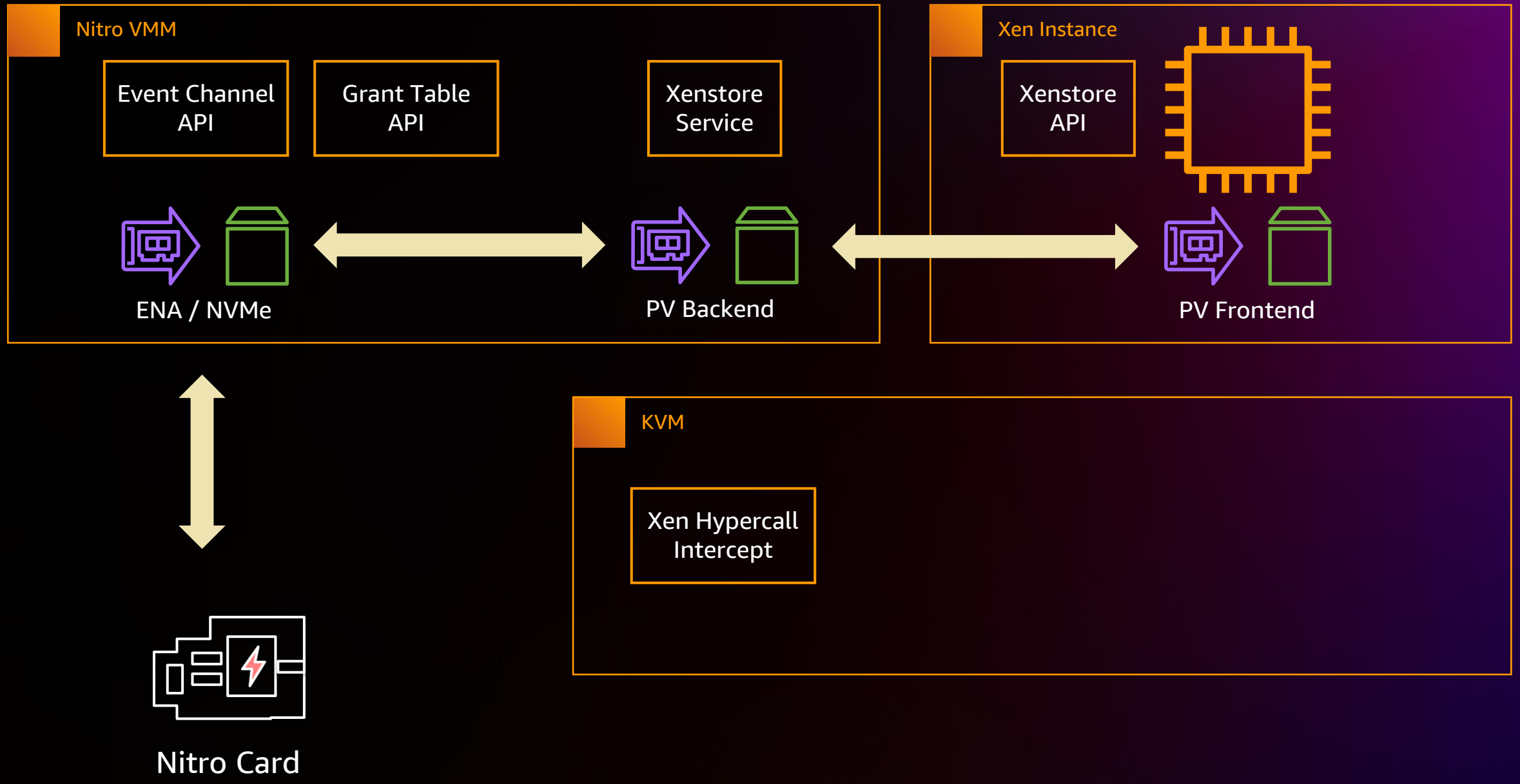
Nitro Card

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New EC2 Experience
Tell us what you think

- EC2 Dashboard
- EC2 Global View
- Events
- Tags
- Limits

Instances
- Instances New
- Instance Types
- Launch Templates
- Spot Requests
- Savings Plans
- Reserved Instances New
- Dedicated Hosts
- Scheduled Instances
- Capacity Reservations

Images
- AMIs
- AMI Catalog

Elastic Block Store
- Volumes
- Snapshots
- Lifecycle Manager

Network & Security
- Security Groups
- Elastic IPs
- Placement Groups
- Key Pairs
- Network Interfaces

Load Balancing

Request to manage tags has succeeded.

Instances (3) Info

Connect | Instance state | Actions | Launch instances

Find instance by attribute or tag (case-sensitive)

re:Invent 2022 = All values | Clear filters

1

Name	XoN-EAP	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zo
C1 XoN	–	i-0bd6f7efcbaa17680	Running	c1.medium	2/2 checks passed	No alarms	us-east-1d
C1 Xen	–	i-057aebc37e27794b6	Running	c1.medium	2/2 checks passed	No alarms	us-east-1d
Nitro	–	i-07ba3a1e1adcf290d	Running	d3.xlarge	2/2 checks passed	No alarms	us-east-1c

Select an instance

What's next?

How do I onboard to this?

Do I need to re-qualify my workloads?

Do I need to schedule a migration maybe?



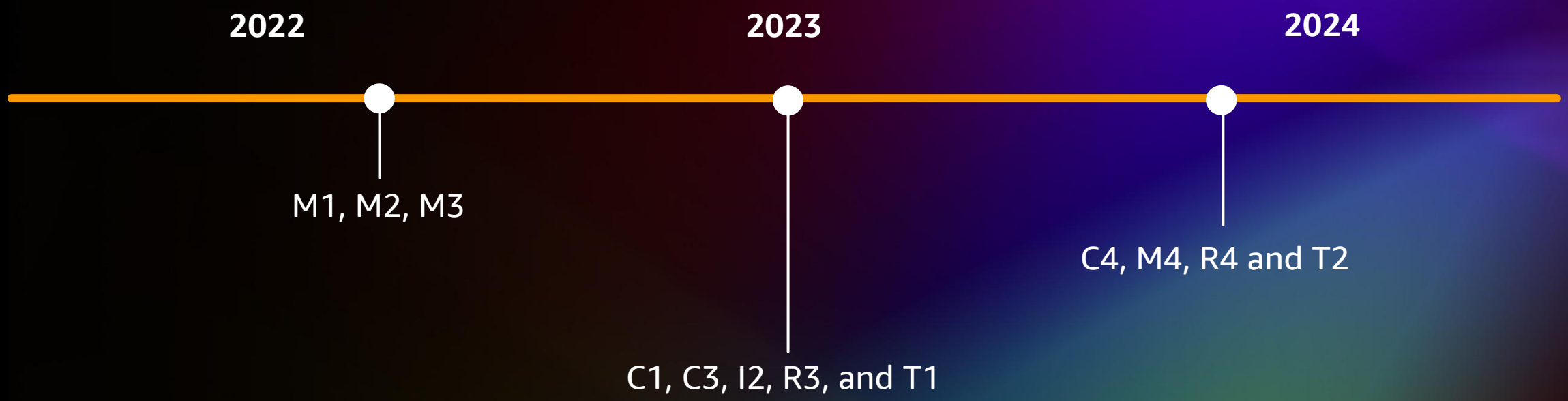
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Q&A

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Q&A

Q. Which previous generation instances will receive Nitro System support and within what time frame?



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Q&A

Q. What actions do I need to take to migrate my existing previous generation instances?

- Customers will not have to take any action for migrating active previous generation instances running on older generation hardware.
- For instances that are on older generation hardware, each customer account ID mapped to instance(s) will receive an email notification 2 weeks prior to the scheduled maintenance.
- Similar to our typical maintenance events, customers will have the option to reschedule their maintenance as many times as needed within 2 additional weeks from the original scheduled maintenance time.

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Q&A

Q. Do I need to rebuild/recertify workloads that run on previous generation instances enabled by the AWS Nitro System?

- No, customers don't need to rebuild/recertify workload run on previous generation instances enabled by the AWS Nitro System.

Q. Will there be any changes to my instance specifications once migrated to AWS Nitro System?

- There will be no change to instance specification of previous generation instances when instances are migrated to AWS Nitro System.

Q. Will there be changes to pricing and billing when previous generation instances are migrated to AWS Nitro System?

- There will be no change to billing and pricing. We will continue to support the same pricing models we support today for the previous generation instances (on-demand, 1yr/3yr Reserved Instance, Savings Plan, Spot).

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Q&A

Q. What is the difference between previous generation instances enabled by the AWS Nitro System and current generation Nitro-based instances?

Nitro-based instances

- ✓ Built on modern Nitro hardware using lightweight AWS Nitro Hypervisor
- ✓ Continuously monitored by AWS Nitro System
- ✓ Offer better performance
- ✓ Offer better price performance

Xen instances running on the AWS Nitro System

- ✓ Built on modern Nitro hardware using Nitro hypervisor having paravirtual devices and Xen hypervisor interfaces
- ✓ Continuously monitored by AWS Nitro System

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Thank you!

Alex Bestavros

Rod Harrison



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