

# Assignment Assumptions

- The presentation follows Dell Tech Foothills release guideline
  - The actual release content was much wider than described in the ppt
- Presentation content is based on:
  - [Dell PowerStore 2.0 release notes](#)
  - [Dell EMC blog](#)
  - My role (Release Train Engineer/ TPM) & experience in the Program
- Program Management at Dell is different than SW based Products (involves SysQA, branch mng, promotion constrans etc.)
- The content refers to a middle of Foothills/ timeboxed to Q2/2023/, status overview
  - Presentation takes place on April 27th 2023
- At Dell Program is ON TRACK when P0s (and prioritized P1s) are ON TRACK

# Foothills Program Update

## PowerStore 2.0



Date: 5/31

Presentation date: April 27th

Ido Dagan

# Agenda

- Background
- Executive summary
- Stakeholders dashboard
- Eng updates
- Timeline
- Beta preparations
- Program metrics
- POC urgent requirement & implications on quarter plans

# PowerStore Roadmap Strategy

**Disrupt**



**SmuttyNose**

March 2023

- Container based
- Built for NVMe + SCM
- Intelligent scale up & scale out
- Unified Block, File, and VVOLs
- AppsON

**Expand**



**FootHills**

June 2023

- New Low Cost Platform
- NVMe Host Attach (NVMeoF)
- DRE
- Enterprise Features

**Future Proof Program w/ Anytime Upgrade & 4:1 DRR Guarantee**

# Foothills Content Overview

## Platform

- **PowerStore 500T (Riptide)**
- **NVMe/FC**
- Add SLICs in the field

## Core

- **Dual Parity DRE/ Dynamic Resiliency Engine**  
(previously known as 'RAID 6')
- Meta-data tiering on SCM drives

## Enterprise Features

- VMware: vVOLs replication w/ SRM
- VMware: vVOLs NVMeoF
- 32 Storage networks support
- SNMP support
- Serviceability enhancements (e.g. 5 sec perf. metrics)
- Localization/Internationalization

## File

- **File perf. metrics in dashboard**

# Executive Summary

- Program is **ON TRACK** to 6/30 RFD & 7/10 RTS
- Program phase: Execution
- Callouts:
  - Platform Core provided 5 hot fixe (NVMe/FC) and unblocked main branch, and thus DP merged (DRE) on-time! Thanks to Devops & Eng teams for quick turnaround!
  - Preparing to the next Program milestones:
    - P0 feature complete 5/7
    - EKT & initial Beta drop 5/15-17

Deliverable	Date
Feature complete	5/18
RFD (Release From Development)	6/30
RTW (Release To Web)	7/10
RTS (Release To Ship)	7/10

# Stakeholders Dashboard

Function		Status	Comments
Overall		G	P0 features are ON TRACK content being promoted from collab branches to Main, and running through regression test, EKT readiness to be finalized mid-next week & preparing for Beta drop
Product Management		G	No material changes for release content. Sales/presales/CS enablement training kickoff on 5/15-17.
Engineering	PowerStore software ENG	G	Details in the following slide
	Storage Networking & Devices (DNS)	G	All HW regulatory certifications completed
	SysQA	G	Target 6/20 for 100% pass rate
	Technical Marketing Engineer (Beta)	G	Beta expected for 10 sites
Services		G	EKT training materials ON TRACK for May 15th
Product Marketing		G	Messaging is in final executive review
Release content		G	On track for 7/10 posting

# ENG - Foothills Deliverables

Major Area	Summary	Key	Status	Priority	Risk Level
CP	VMware: vVOLs replication w/ SRM	TRIF-159	Implementing	P1	Yellow
	VMware: vVOLs NVMeoF	TRIF-465	Implementing	P1	Green
	SNMP support	TRIF-574	Implementing	P1	Yellow
	Localization/Internationalization	TRIF-80	Implementing	P2	Green
					Green
Data Path	Dual Parity DRE	TRIF-203	Implementing	P0	Green
	Meta-data tiering on SCM drives	TRIF-90	Implementing	P1	Yellow
Hoysala	File Metrics at the appliance and cluster level	TRIF-551	Implementing	P0	Green
Platform Group	PowerStore 500T (Riptide)	TRIF-323	Implementing	P0	Green
	NVMe-oF/FC-NVMe Front End Connectivity	TRIF-269	Implementing	P0	Green
	32 Storage networks support	TRIF-468	Implementing	P1	Green
PLT - SLICs	Add SLIC After Initial Config - Part I	TRIF-25	Implementing	P1	Green
Serviceability	Serviceability enhancements (e.g. 5 sec perf. metrics)	TRIF-460	Implementing	P1	Green
Grand Total					



# ENG - Foothills Key Drivers

RFD: 6/30/2023  
RTS: 7/10/2023



Item	Current Status	Comments
Platform: PowerStore 500T (Riptide)	G	Release promotion priority is platform latest Riptide version from Collaboration branch to Main branch (April 30th). After running regression test, hot fixes will be prioritized. PowerStore upgrade for this drive firmware - completed On track to complete development by 5/7
Data Path: Dual drive failure/ DRE/ Dynamic Resiliency Engine	G	Significant improvement in endurance over the last 2 weeks in Main branch. Endurance KPI 166h vs. 168h plan Defect backlog down from 30 to 5. 2 of the remaining 5 with fixes with ETA today. On track to close CI regression backlog by 5/7
Platform: NVMe/FC (Nonvolatile memory express over Fibre Channel)	G	NVMe-oF message-based model to send requests and responses between a host and a target storage device over a network fiber channel- works as expected in collaboration branch. Last promotion to Main planned for May 1st. The initial design goal for NVMe-oF was to have no more than 10 microseconds of latency between the NVMe host and NVMe storage target, we are at an average of 8. On track to close CI regression backlog by 5/7
Defect backlog	G	50 defect in backlog – lower than SN at the equivalence point of the program Expected to decrease as we get to 100% coverage Deferrals quota allow for defers are 10% defects On track to get to zero defects before 6/30
Performance	G	Results 4%-6% below SN, as more content will merged the better IOPS and throughput will perform. Riptide performance yet to be analyzed

## Risks

Risks/Issues Summary	Probability (H/M/L)	Impact (H/M/L)	Mitigation Plan	Mitigation Status
NDU functionality	M	L	NDU SN->FHC, will be delivered to SysQA on May 18th Marketing efforts on PowerStore 500T (Riptide)	G

# Risk Register

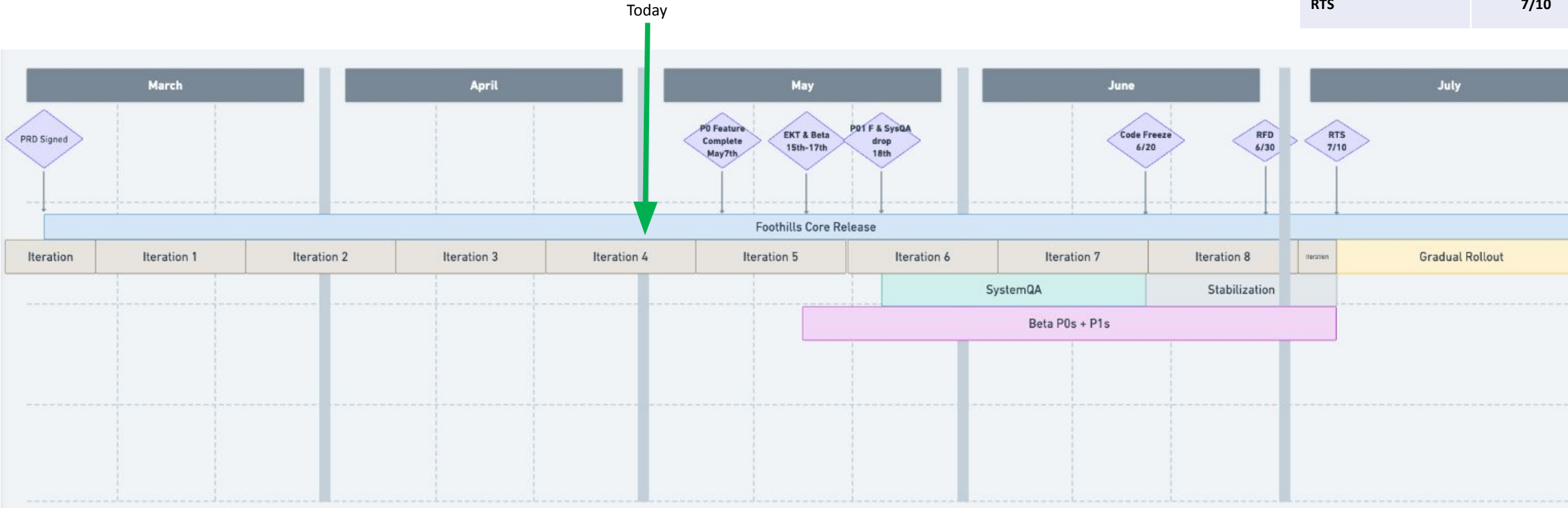
IMPACT	High			
	Medium			
	Low			
		Low	Medium	High
PROBABILITY				

Feature	Priority/ Risk score	Commentary/ Mitigation
File perf. metrics in dashboard	P0	Capacity, Performance: latency/mili, IOps/ thouthans, bandwidth/ MB/s
Meta-data tiering on SCM drives	P1	Tiering enabled on SCM and flash storage in the same chassis with PowerStore directing metadata to the higher-performing layer automatically reduce goal workload latency by up to 15% is now 7% DP will be prioritizing code commit after DRE promotion
VMware: vVOLs NVMeoF	P1	NVMe-vVol host connectivity supporting NVMe/FC vVols API integration to VASA 4.0 and vVols 3.0 - IN PROGRESS
VMware: vVOLs replication w/ SRM	P1	Synchronization of the storage provider in vCenter randomly fails, might require automatic synchronization recovery by CP.
32 Storage networks support	P1	Powerstore 32 frontend Storage networks per appliance
Add SLICs in the field	P1	FE can be changed in client site
SNMP support	P1	Simple Network Management Protocol (SNMP) management and monitoring of network-connected devices: routers, switches are not identified by the storage target. Will get higher priority after vVol work promotion
Serviceability enhancements (e.g. 5 sec perf. metrics)	P2	Logs are being sent to the storage destination from Dell CloudIQ

# Timeline

Foothills Overall Program update  
Current Phase : Execution

Milestone	Date
P0 Feature Complete	5/7
EKT & initial Beta drop	5/15-17
P01 feature complete & SysQA initial drop	5/18
Code Freeze	6/20
RFD	6/30
RTS	7/10



# Beta Dashboard

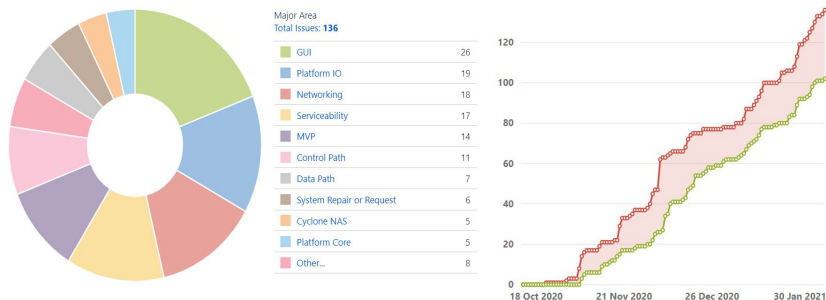
## TESTER SUMMARY

### Tester Info:

- Mr. Steve has been working with Client X for 19 years as a Senior Solutions Architect. He has been performing Beta and POC tests for many years on different Dell EMC products...
- Client X, gives training to engineers and some sales folks as part of his work. Client X is looking forward to testing the newest mid-range product of PowerStore and wants to provide his feedback prior to launch.

## TESTER COMMENTS

### PowerStore Initial Setup



### Client X

## TEST ENVIRONMENT

- 1x PowerStore 3000T Model (Cluster created)
  - Software Version 2.0.0.0-1272912
  - 7x 1.92TB NVMe Flash
  - 2x 8GB NVMe NVRAM
- 1x PowerStore 3000X Model (Cluster Created)
  - Software Version 2.0.0.0-1272912
  - 10x 7.68TB NVMe Flash
  - 2x 8GB NVMe NVRAM
- 2x PowerStore 500T (Riptide)
  - Software Version 2.0.0.0-1272912

## ISSUES REPORTED



Defect Tracking (DT)

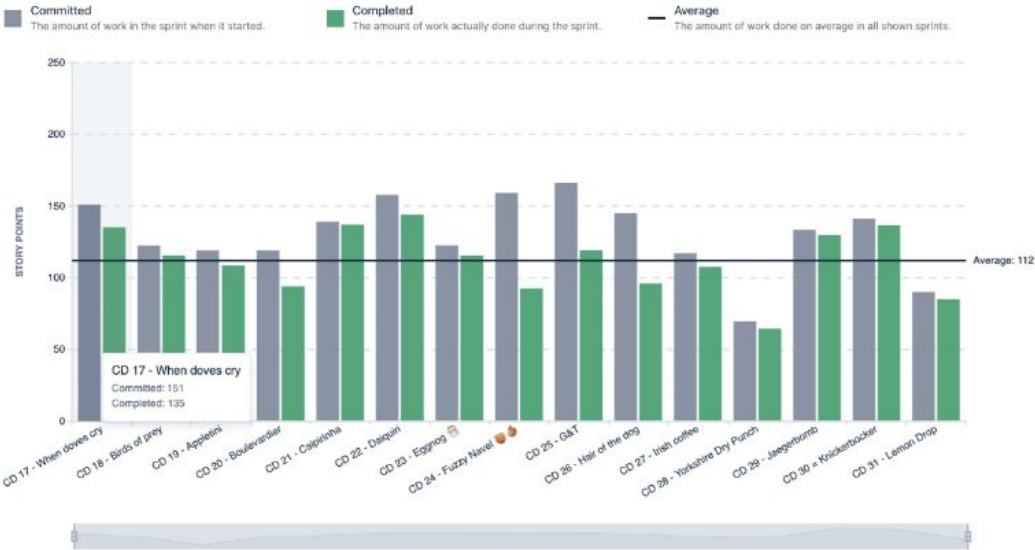
## TESTED FEATURES

- ❖ PowerStore Initial Setup
- ❖ PowerStore Licensing

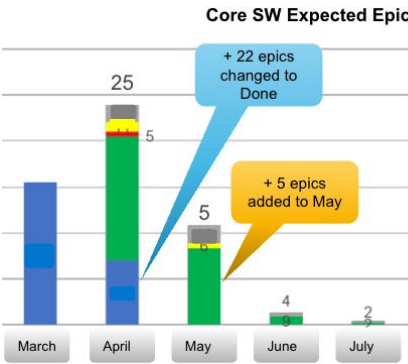
# Release Tracking & Reporting



## Velocity

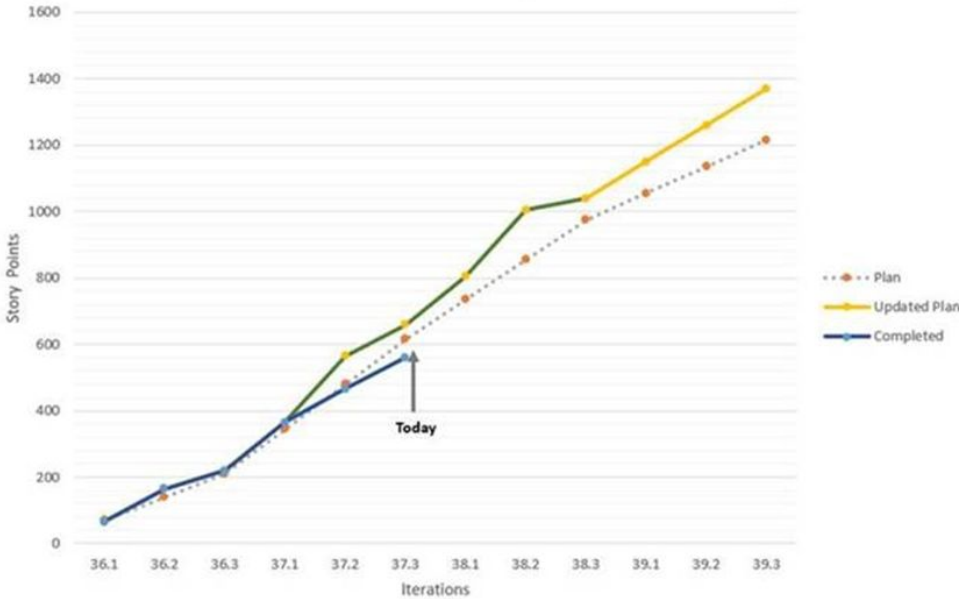


## Epic analysis



- Insights:
- 29% Completed epics in March
  - 85% probability to complete all epics in time- increase of 3%
  - + 5 epics added to April
  - -1 epic in Red
  - Yellow +2 in 39
  - No risk -12 from last week
  - High risk areas: CPDM-GUI, DP-IL, Platform Group - IL

## Burn-up



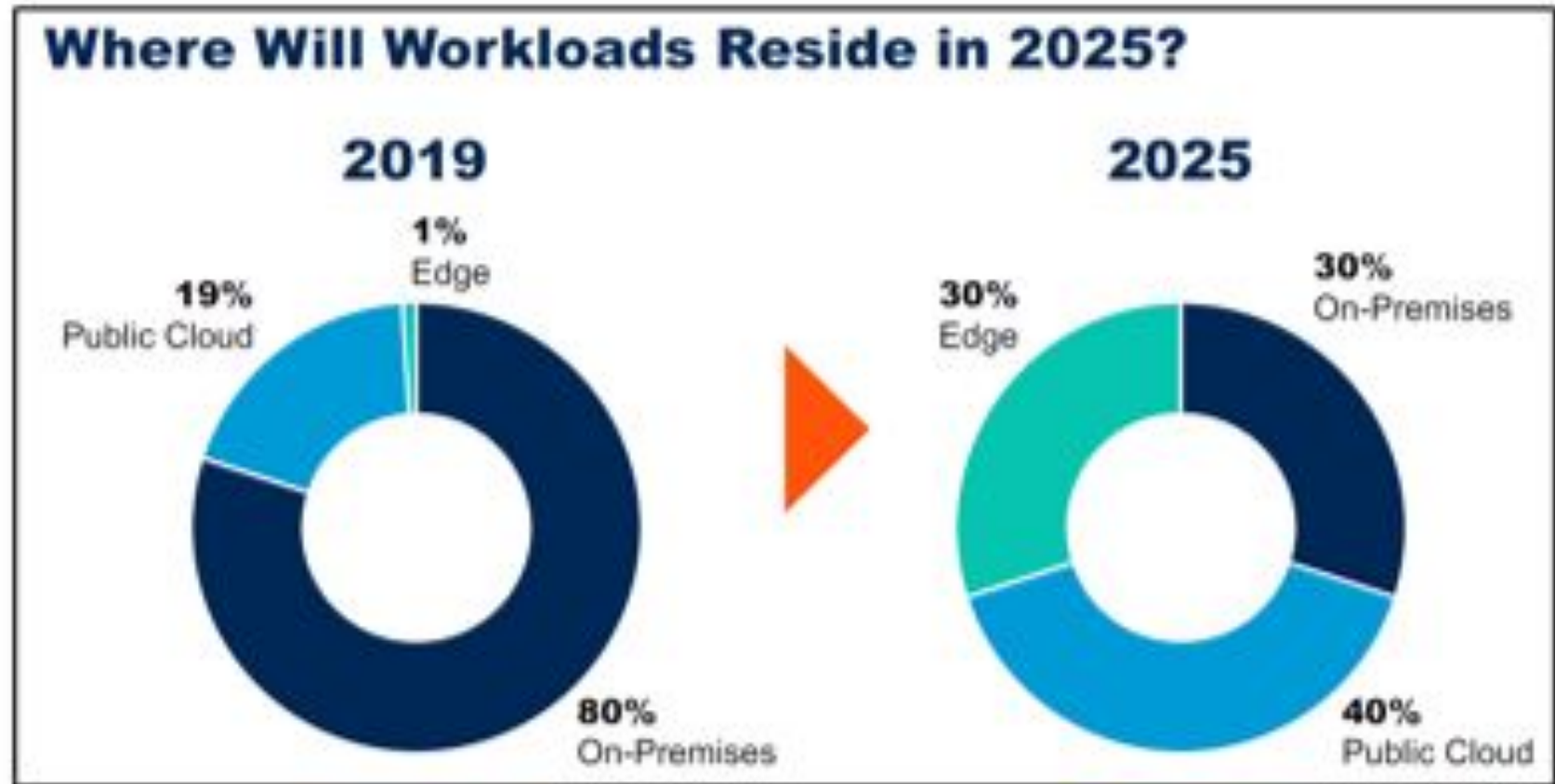
# POC

## PowerStore VSA- MVP

PowerStore 2.0



# Workloads Deployments Forecast



Source: Gartner IO&C summit 2020 - 4 Must Do's to Take Control of Your Storage Infrastructure and Data Services to Support Change, Julia Palmer

# Use Cases

## Top customer needs

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### **Block & File**

- Migrating workloads from on-prem to the cloud
- Deployment of net new application in the cloud
- Test/Dev and Cloud Bursting

### **Advanced Users Use Cases:**

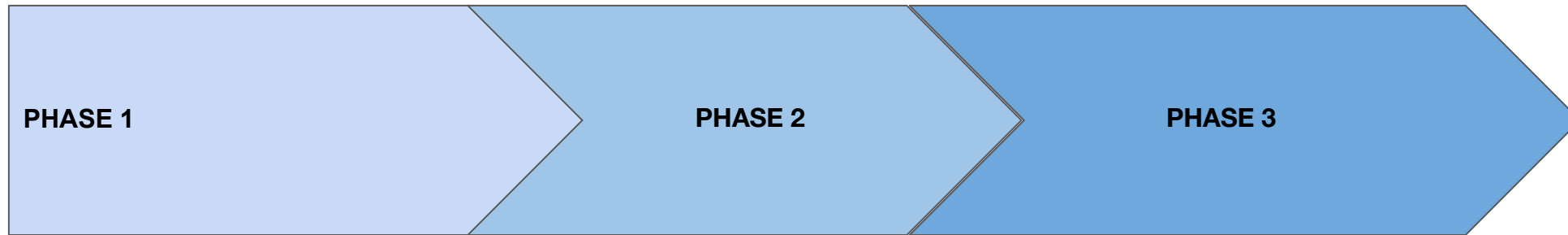
- Disaster Recovery
- Migrating workloads from on-prem to the cloud and back



# R&D Effort Estimation (phase 1 & 2)

#	Infra descriptions	Efforts (hours)	T-shirt
1	Product design	12	M
2	Create infrastructure Create service Implement logic DevOps issues service declaration IT expand VPC, vLUNs, configure IPs	36	XL
3	Command manager Command executor	12	M
4	Cache manager Cache declarations Cache full tests	12	M
5	Unit tests Integration tests	36	XL
6	GUI integrations Infrastructure UI	30	L
7	Create integration with AWS	30	L
8	Investigation EBS Implement image in EBS	30	L
TOTAL	5 developers	198 hours	

# PowerStore VSA → POC Enablement Plan



POC Enabler  
2 CP dev  
2 iteration

- OVA- image creation & template
- Basic VSA startup- create cluster, basic I/O
- Basic GUI support, create volumes
- Initial Single node support
- Scale down memory, GUI full support

- Performance
- High availability- resolve single point of failure
- Critical to avoid DL and reduce DU
- Licensing- must support 1-year or 3-year paid license
- Pay-as-you-go licensing in the public clouds for on-demand VSA provisioning
- Security
- Upgrade
- Data reduction

- Workload mobility to the cloud, DR, Test/Dev and Bursting
- Replication On-Prem to/from Cloud
- Data Reduction
- Compression
- CloudIQ Integration
- Consistent experience as on-prem
- A simple deployment option. Starting from cloud provider Marketplace
- Native integration, no dependency on VMWare
- No single point of failure

# Q2 Updated Plan - Alternatives

RFD: 6/30/2023  
RTS: 7/10/2023

Y

Option A

Feature	Priority/ Risk score	Commentary/ Mitigation
P0 features	P0	PowerStore 500/Riptied, NVMe/FC, DRE, File metrics support
Meta-data tiering on SCM drives	P1	Tiering enabled on SCM and flash storage in the same chassis with PowerStore directing metadata to the higher-performing layer automatically reduce goal workload latency by up to 15% is now 7%
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Serviceability enhancements (e.g. 5 sec perf. metrics)	P2	Logs are being sent to the storage destination from Dell CloudIO.
VSA- Phase 1-M1	P0	OVA- image creation & template Basic VSA startup- create cluster, basic I/O

Option B

Feature	Priority/ Risk score	Commentary/ Mitigation
P0 features	P0	PowerStore 500/Riptied, NVMe/FC, DRE, File metrics support
Meta-data tiering on SCM drives	P1	Tiering enabled on SCM and flash storage in the same chassis with PowerStore directing metadata to the higher-performing layer automatically reduce goal workload latency by up to 15% is now 7% DP will be prioritizing code commit after DRE promotion
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# Core Team Recommendation

- Summary:

- As all of CPs features are marked at Risk
- PowerStore Foothills release will re-scope CPs features to:
  - VMware: vVOLs NVMeoF
  - PowerStore VSA POC enablers: image, basic CC, basic I/O
- EKT content to be updated
- No effect on Program P0 features, Beta & SysQA drops
- Post Approval Program plans will change back to **ON TRACK** to support 6/30 RFD
- Defer VMware: vVOLs NVMeoF w/SRM & SNMP support to the following release

**Core Team Request and Recommendation: Option B→ Requires PCR for Foothills**

# Executive Approvals

Functional Area	Approvers	Decision
Storage Division President	Dan Joe	
Storage Product Management	Tomer Cohen	
Program Management	Samuel Krikel	
ISG CS	Caitlin goodman	
Platform/Systems Development	Bill DePatie	
Quality	Nir Dane	
Engineering	Eyal Shpin	

**Core Team Request and Recommendation: Option B → Requires PCR for Foothills Core**

# THANK YOU- Proofpoint!

## PowerStore 2.0



# Executive Summary

## Market and Customer Needs

- Customers want a holistic hybrid IT offering, operating with continuity of experience between on-prem and cloud
- Customers want a block & file storage with data-services, data reduction and high availability, low-latency, high-performance and a flexible native cloud solution
- Customers are gravitating to competitive options providing cloud native offering

## Concept Proposal & How It Will Win

- Release a PowerStore VSA with advanced data services providing data reduction equivalent to our purpose-built array
- Extend Dell's advanced block and file strategy to the cloud to meet the customers business needs
- Provide a consistent experience between on-prem and cloud with optional APEX console integration
- Supports snapshot shipping from PowerMax and PowerFlex to PowerStore VSA
- Simplifying the customer purchase experience through the cloud provider marketplace

## Roadmap, Timing and Ecosystem

- Targeting Victory release (H1/FY24) with tech-preview available 3Q before
- Release more capabilities over time as they are developed for other programs of work, application initiation solutions

## Business Case

- Migration of workloads to the cloud with no need to copy it back and net new applications. Storage level migration which requires some customer automation: Migration to the cloud and back, Disaster Recovery, Test/Dev.
- Elevate the option for on-prem sales
- Leverage customer cloud spent commitment budgets on PowerStore VSA to increase PowerStore addressable market
- Revenue \$282M – 3Yr revenue (FY24-FY26) for both DR & Test/Dev (\$190M) and on-prem impact (\$92M)

## Key Dependencies & Risks

- Offering getting into the cloud provider marketplace
- Native Cloud Integration – effort per cloud provider
- HA with the cloud compute and storage resources
- Competitive price