ATTACHMENT E

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# Project Proposal

#### **Data Center Refresh Proposal**

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**[re]Design D&LL**Technologies



### **PowerEdge Compute with PowerStore Storage**

Servers – (3) PowerEdge R650 Servers Storage – (1) PowerStore 500T NVMe Storage Array Backup – (3) Sockets PowerProtect Data Manager + (1) Data Domain DD6400 Appliance

Implementation – [RE]DESIGN Onsite Implementation & Migration Services

### **PowerEdge 15G Overview**



*PowerEdge Servers are the Bedrock of the Modern Data Center. The platform delivers in 3 key areas:* 



All PowerEdge 15G Server Models include iDRAC 9 Management



#### **Key Features** Increasing performance for PowerEdge with NVDIMM dramatically increases speed of access and performance for applications like SQL NVDIMM for Persistent Memory In Memory DB Increasing capacity for VDI Multi Vector Cooling, GPUs PowerEdge can now support 33% more instances and up to 192 VDI users per server OpenManage Enterprise delivers increased automation through powerful scripting APIs & iDRAC RESTful API. Mobile Scripting APIs and mobile monitoring Continue to slash OPEX management via Quick Sync 2 for Android / Apple devices PowerEdge has new security setting that shuts downs updates Mitigate security risks System Security Lockdown to protect server configuration / firmware from malicious changes



### **PowerStore Overview**









### **PowerStore + PowerEdge**

	Compute					
	(3) PowerEdge R650 Servers					
CPU	Single Intel 6342 Processor   24 Cores x 2.8 GHz 24 cores per node (67.2 GHz)   <b>72 cores per cluster (201.6 GHz)</b>					
Memory	1024 GB (16 x 64 GB DIMMs) per node   0 open slots <b>3072 GB per cluster</b>					
Drives	(2) 480GB SATA MU SSD @ RAID 1   OS PERC H755					
NICs	<ul> <li>(1) Mellanox ConnectX-5 Dual Port 10/25GbE SFP28, OCP 3.0</li> <li>(1) Mellanox ConnectX-5 Dual Port 10/25GbE SFP28, PCIe v2</li> <li>4 Ports Used per Node   RDMA Enabled</li> <li>12 Ports Total</li> </ul>					
Switches	(2) <b>S5224F -</b> (24) 25G SFP28 Ports per Switch					
Power	(2) 1100W Fully Redundant (1+1) PSU 120-240V Autosensing					
Licensing	vSphere Enterprise Plus – None Included Windows Data Center 2019/2022 – None Included					
Support	60 Months ProSupport Mission Critical (4 Hour)					
Services	[RE]DESIGN White Glove Implementation Services					

	Storage
	PowerStore 500T
CPU	(1) Intel CPU   (12) Cores x 2.2 GHz Per Controller (24) Cores   52.8GHz Appliance Total
Memory	96GB Per Controller 192GB Appliance Total
Drives	(8) 1.92TB NVMe SSD – Single Drive Failure (4+1) ~17 Open Capacity Slots
Capacity	15.35TB Raw   9.8TB Usable   <b>29.4TB Effective</b> Includes Custom 3 : 1 Data Reduction
Performance	Unified   <b>VVOL + LUN</b> Workload 5,000 IOPS @ 40.96MB/s Max Workload 89,719 @ 734 MB/s
Power	(2) 1450W Fully Redundant (1+1) PSU 120/240v LowLine/HighLine
NICs	(2) Quad Port 10/25GbE SFP28 Mezz (2) Quad Port 10/25GbE SFP28 IO Module 6 Ports Used per Controller <b>12 Ports Total</b>
Support	60 Months ProSupport Mission Critical (4 Hour)
Services	[RE]DESIGN White Glove Implementation Services

# CUPERTINO (3) R650 Servers

(1) PowerStore 500T



9 Total Rack Units



### **Current State Comparison**

Current State vs. VxRail + PowerStore Cluster								
Component	Current State	New VxRail + PS Cluster	Difference	% Difference				
CPU	4	3	-1	-25%				
Cores	56	72	16	29%				
vCPU Ratio	1:5.8	1:4.51	-1.29	-22.24%				
Peak CPU (GHz)	78	201.6	123.6	61% Free				
Net CPU (GHz)	123.2	201.6	78.4	64%				
Peak Memory (GB)	1054.72	3,072	2,017	66% Free				
Net Memory (GB)	1,536	3,072	1536	100%				
Storage Used (TBu)	18.68	29.4	10.72	36% Free				



### **PowerProtect & PowerProtect Data Manager Overview**





### **Data Protection – Sizing Recommendation**

Name	Туре	Protocol	Application	Max MB/Sec Req.	Growth %	RawFull TB	Raw Inc TB	Total Retained TB	Data Changed TB	Reduction Ratio	Reduction %
Rich Media - 3wk Retention	File System	DD BoostVS (Win)	PowerProtect	52.69	10.0	1.14	0.0342	36.32	1.93	18.78:1	94.69
General VM - 3wk Retention	VMDK-Content is File System	DD BoostVS (Win)	PowerProtect	235.7	10.0	5.1	0.153	162.47	2.97	54.79:1	98.17
Database - 3wk Retention	DB-SQL	DD BoostVS (Win)	PowerProtect	56.38	10.0	1.22	0.0366	38.86	0.92	42.25:1	97.63
General VM - 5wk Retention	VMDK-Content is File System	DD BoostVS (Win)	PowerProtect	40.21	10.0	0.87	0.0261	46.11	0.63	73.54:1	98.63
Database - 5wk Retenion	DB-SQL	DD BoostVS (Win)	PowerProtect	4.16	10.0	0.09	0.0027	4.77	0.08	56.12:1	98.32
File - 5wk Retention	File System	DD BoostVS (Win)	PowerProtect	4.16	10.0	0.09	0.0027	4.77	0.07	64.55:1	98.53
Rich Media - 5wk Retention	File System	DD BoostVS (Win)	PowerProtect	10.63	10.0	0.23	0.0069	12.19	0.44	27.52:1	96.39
File - 3wk Retention	File System	DD BoostVS (Win)	PowerProtect	217.21	10.0	4.7	0.141	149.72	3.26	45.92:1	97.82

- Capacity Recommended with Data Domain(TB):
  - 12.13
- Capacity Recommended w/out Data Domain(TB):
  - 455.21
- Storage Savings
  - 97.74%

## 

### **Production Backups**

PowerProtect Data Domain 6400 + Data Manager Software						
System	PowerProtect Data Domain 6400 + PowerProtect Data Manager Software (Socket-Based)					
Capacity	Active Tier Capacity - 16 TBu					
Software	(3) Sockets PowerProtect Data Manager (3 Year Subscription)					
Connectivity	(2) 25G SFP28 Ports					
Services	[RE]DESIGN White-Glove Implementation Services					
Support	60 Months –ProSupport (4 Hour)					

POWERPROTECT DD6400 DATA PROTECTION APPLIANCE



- Efficient → Industry average 30:1 deduplication ratio
- Integrated → Native integration and single line of support between SW/HW
- **Cloud Enabled** → Industry leading public cloud integration for LTR & DR
- Secure → FIPS-140-2 Encryption At-Rest and In-Flight



### [RE]DESIGN Implementation Services



[RE]DESIGN will provide onsite resource(s) to complete comprehensive, white-glove implementation of every component included in this order. This includes install, configuration, testing, validation, integration, documentation, and a tested and executed migration plan.

Phase 1

#### Rack & Stack:

- Unpack and inspect all hardware
- Rack, mount and/or position all products and components
- Install and route power, data, and KVM cables
- Apply customer-provided labels to newly installed cables
- Power on all equipment
- Confirm server boots and check for errors on all systems
- Configure network addresses on IPMI (i.e., iDRAC) if applicable

#### Network, Compute & Storage Implementation:

- Install and Configure Backend Network Switches
- Install Hypervisor and cluster manager (i.e., ESXi and vCenter)
- Confirm all component drivers and firmware are latest supported versions
- Configure Cluster and Converged Datastore
- Setup encryption and key management if required
- Install latest firmware and software patches/updates
- Activate and Install all licensing for all servers and storage hardware
- Validate systems implementation and review results with customer
- Setup vendor support systems and automated health checks (i.e., Dell ESRS or Support Assist)

#### **Backup System Implementation:**

- Install and Configure backup system (i.e., IDPA/PowerProtect)
- Install firmware and software patches/updates
- Enable backup storage encryption if required
- Configure backup server
  - Connect to virtual infrastructure if applicable
  - Deploy backup proxies if applicable
  - Setup test VM/server backup
- Perform Functional Overview and Knowledge Transfer
- Assist with Configuration of backup policies

#### Testing, Validation and Documentation:

- Verify that all components have network connectivity to Client's network
- Perform basic verification tests (i.e., ping, traceroute, show commands)
- Test product failover capability
- Verify configuration aligns with the design
- Create vendor support requests to update all client configuration information and entitlements
- Conduct Knowledge Transfer with the client
- Register customer to receive vendor product alerts if required
- Handover As-Built Documentation

#### Phase 2

#### **Production Migration:**

- Identify all existing Network, Storage, Server, Backup, and VM Configs
- Establish and execute migration framework/plan
  - Establish migration order and timeline with Client
  - Setup migration tools (i.e., P2V converter, SAN copy, etc.)
  - Execute limited migration on predefined timeline per Client Change Management policies
- Test and time successful migration using test/non-production VMs
- Includes the migration of up to 25 Servers or up to 10TB of data.
- **Additional Prof. Services SOW** = Any additional server migrations above the 25 servers or 10TB, including server patching/updating or application or 3<sup>rd</sup> party vendor specific migrations, are out of scope.

#### **Impacting Factors:**

**NOTE:** We have separated out the migration as Phase 2 due to inherent nuances that warrant an extended and often fragmented implementation timeline. Examples include:

- Business impact or strict change control
- Complexity of source to target configuration
- Size and variability of workload types
- Legacy tech debt and/or non-supported configurations
- Maintenance, patching, update, or version issues in environment
- Lack of documentation or knowledge of environment
- Resource availability and/or capacity issues



### **Proposed Project Timeline**







#### **CapEx Financial Summary**

COMPONENT	DETAIL	TOTAL INVESTMENT
ESXi Compute	• (3) PowerEdge R650 Servers + 5Y ProSupport (4 Hour)	\$71,376
Production Storage	• (1) PowerStore 500T NVMe Array + 5Y ProSupport (4 Hour)	\$60,729
Backup Storage	• (1) PowerProtect Data Domain DD6400 Appliance (16TB) + 5Y ProSupport (4 Hour)	\$36,387
Backup Software	• (3) Sockets PowerProtect Data Manager + 5Y ProSupport (4 Hour)	\$8,641
Implementation	(1) Onsite Resource for Comprehensive, White-Glove Implementation	Included
Phoenix Site	Identical Configuration at Phoenix location	\$177,133
	\$354,266	



#### **[re]Design**

