



Lenovo ThinkSystem Storage

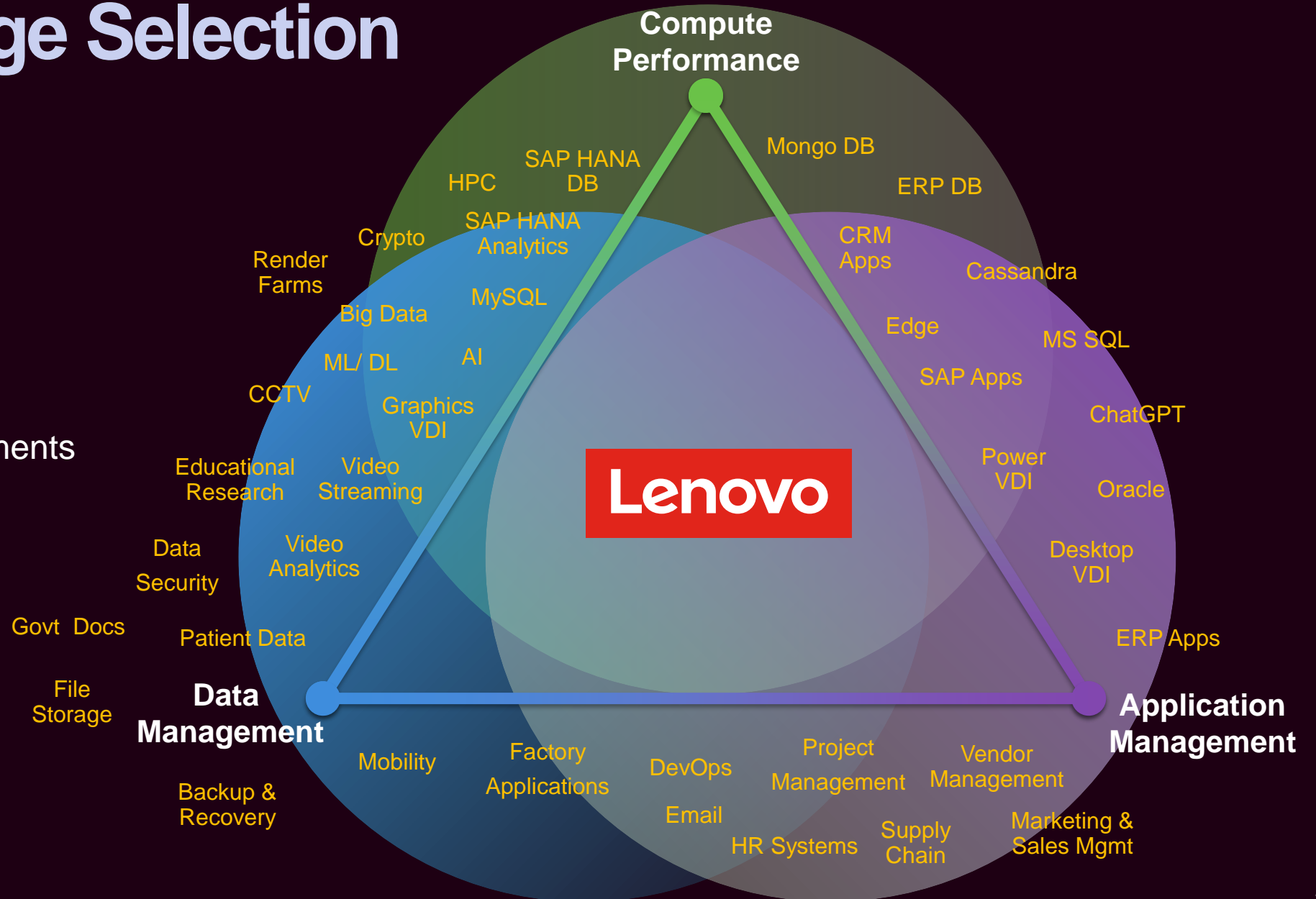
*Александър Марков, pre-sale
engineer*

2024



Data Storage Selection

- Location
 - Datacenter
 - Remote
- Performance
 - IOPS
 - Throughput
- Compliance
- Application Requirements
- Appliance
- Security
- Amount of Data
- Size of Access
- Data Access
 - NAS
 - Block



Lenovo Data Management

Multi-Workload Enterprise Storage

Performance Tuned Storage Single-Workload Exa-scale

Tier 0 RPO 0, RTO 0, Sync Replication
 Low Latency
 High IOPS
 NVMe
 Application Integration for Snapshots

Tier 1 Integrated Workflow Automation
 Snapshots Thin provisioning
 Data Efficiency (Compression, Compaction, Deduplication)
 Adaptive Quality of Service
 Application Based Balanced placement (Performance)
 Local Storage Caching

Tier 2 Scale out Storage Clusters
 High Throughput
 Dynamic capacity expansion
 Remote Storage Caching
 Asynchronous replication
 Backup Software Integration

Tier 3 S3 Object Storage Integration w/ Cloud
 Encryption & Trusted Platform Module (TPM) support
 WORM (Write Once Read Many) Data protection
 AWS, Google, Azure Integration and other Cloud Providers
 Dual Parity RAID Protection, Enhanced Parity (Erasure Coding, etc.)
 Ransomware Protection

ThinkSystem

DM\DG Series

ThinkSystem

DE Series

ThinkAgile

VX HX MX

ThinkSystem

Tape

DSS-G

ThinkSystem

WEKA

ThinkSystem

CLOUDIAN

Millions of IOPS
 100's Gbps of throughput
 nVidia GPU Direct
 Snapshots & Cloning

Cloud Bursting
 Snap to S3
 WORM protection
 10's Gbps of throughput

Encryption
 Data Immutability

Data Management Portfolio

Lenovo
TruScale

ThinkSystem
Enterprise Storage

ThinkAgile
HCI
Hyperconverged Infrastructure

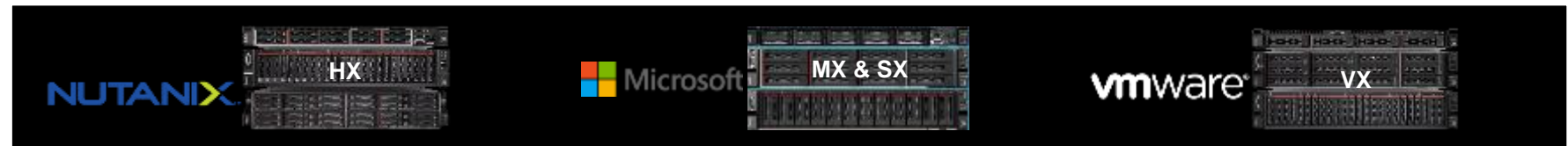
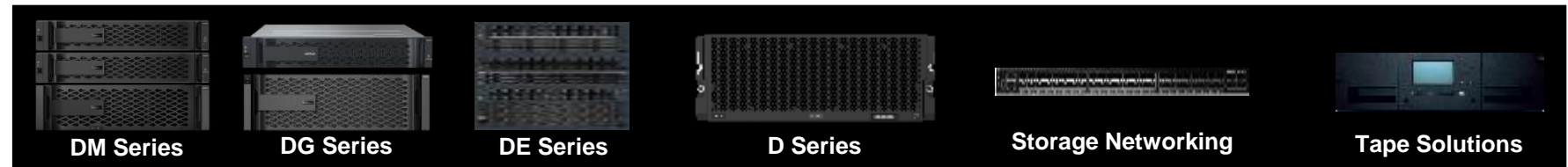
ThinkSystem
SDS
Software Defined Storage

Solution Partners

Lenovo TruScale Infrastructure as a Service

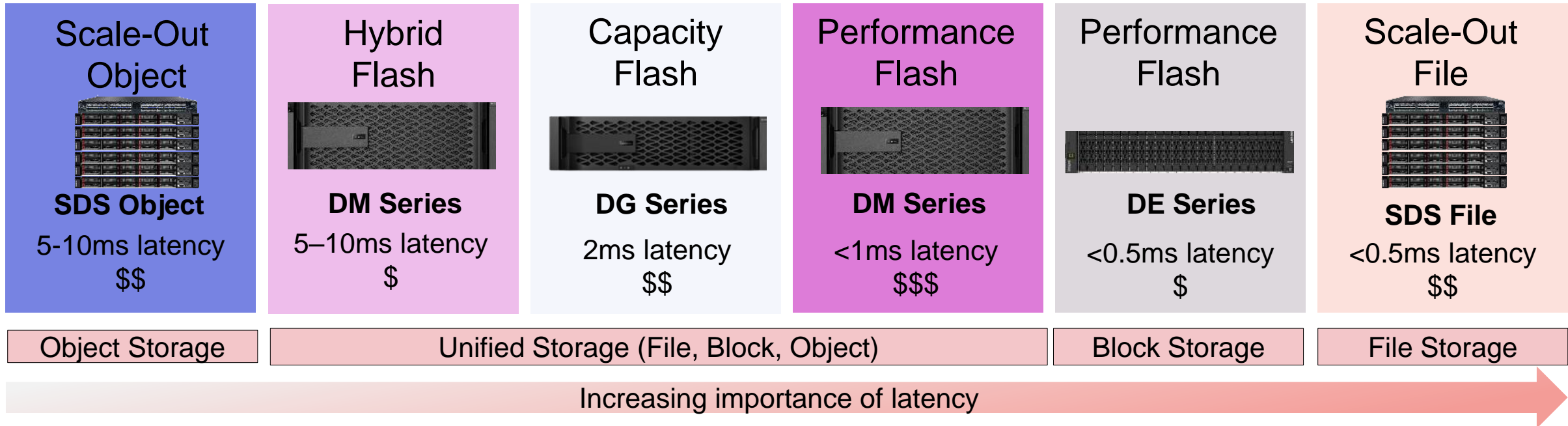
Lenovo TruScale Infinite Storage

Lenovo TruScale Backup as a Service with Veeam



Support Professional Services
Design | Implementation | Support

Storage Portfolio Positioning



Value Prop	<ul style="list-style-type: none"> Capacity-intensive workloads Reduce primary backup tier costs Superior RTO/RPO times 	<ul style="list-style-type: none"> Low-cost entry Low starting capacity Low \$/GB 	<ul style="list-style-type: none"> TCO Energy Efficiency Infrastructure simplification 	<ul style="list-style-type: none"> Unified data management Hybrid multi-cloud support Simplicity of management 	<ul style="list-style-type: none"> Best \$/IOP Ease of deployment SMB friendly 	<ul style="list-style-type: none"> Unlimited scaling Linear performance growth Global namespace
Workloads	<p>Tier 2 and 3</p> <ul style="list-style-type: none"> Data protection Data lakes Data observability 	<p>Tier 2</p> <ul style="list-style-type: none"> Backup/archive File share/object buckets 	<p>Tier 1 and 2</p> <ul style="list-style-type: none"> ERP Microsoft Exchange Data lakes 	<p>Tier 0 and 1</p> <ul style="list-style-type: none"> Databases Mission-critical applications Data Consolidation 	<p>Small Tier 0 and 1</p> <ul style="list-style-type: none"> HPC Single databases Streaming workloads 	<p>Tier 1, Multi-PB Scale</p> <ul style="list-style-type: none"> HPC No SQL databases AI & Machine learning

Multi-Workload Enterprise Storage (<2PB)

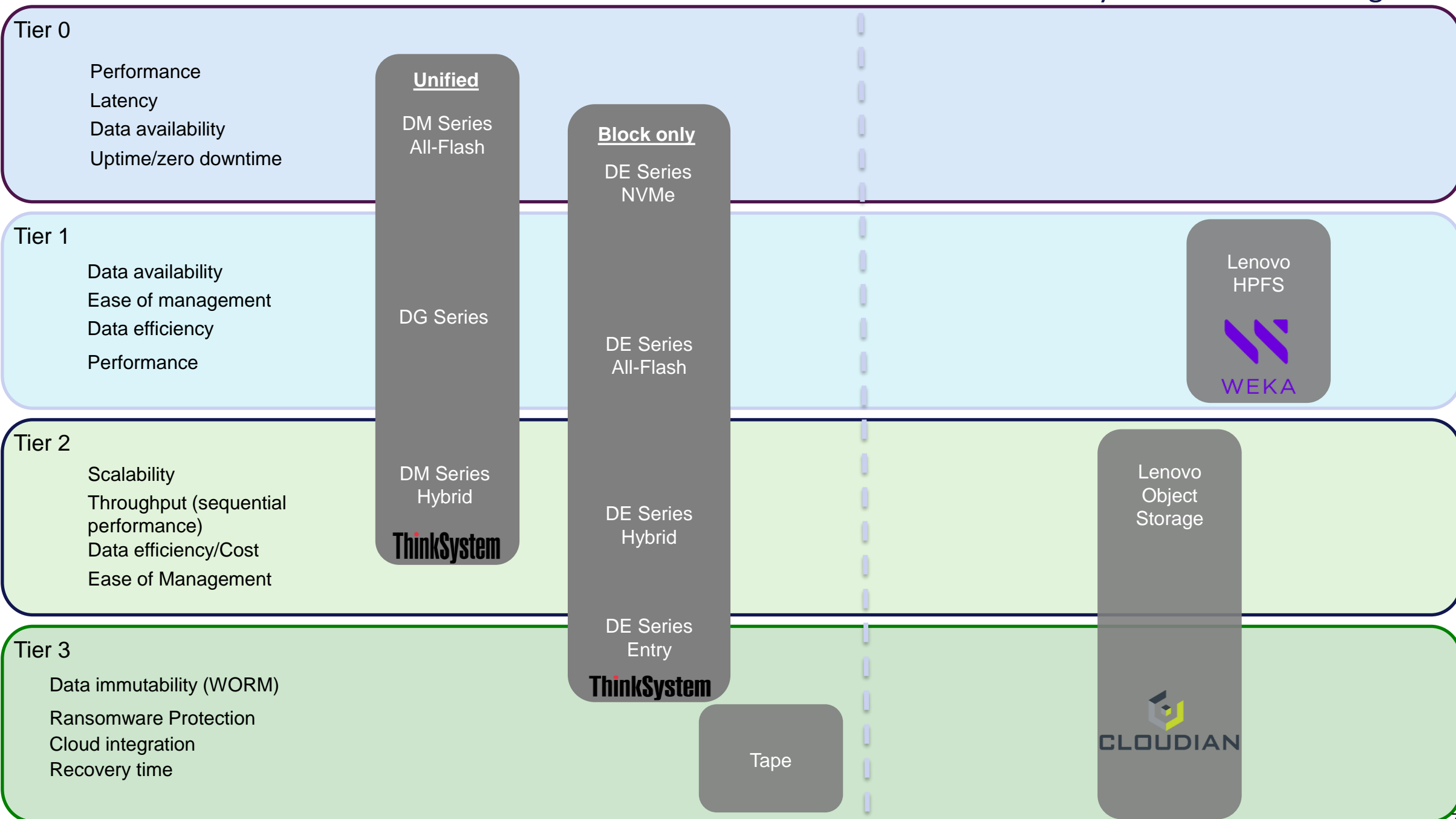
Multi-Petabyte Distributed Storage (>2PB)



	Multi-Workload Enterprise Storage (<2PB)	Multi-Petabyte Distributed Storage (>2PB)	
Tier 0 Performance Latency Data availability Uptime/zero downtime	Mission critical databases eCommerce Business applications		Tier 0
Tier 1 Data availability Ease of management Data efficiency Performance	Databases ERP VDI	AI & Big Data Analytics Machine Learning High frequency trading	Tier 1 Performance Data copy management
Tier 2 Scalability Throughput (sequential performance) Data efficiency/Cost Ease of Management	CCTV/Media streaming Email/Collaboration tools Backup and business continuity	Data lakes Media & Entertainment	Tier 2 Cloud Bursting Performance Public cloud integration Data immutability
Tier 3 Data immutability (WORM) Ransomware Protection Cloud integration Recovery time	Archive File shares Electronic records		Tier 3 Encryption Data immutability Public cloud integration Recovery time

Multi-Workload Enterprise Storage

Multi-Petabyte Distributed Storage



Tape

HPFS Powered by WEKA: High Performance AI Storage, Simplified



Strengths

High performance
Global namespace
Hybrid Cloud Ready



Weaknesses

Large minimum configuration size
Ease of use/Data Management features
No data reduction



Why to Position

Workloads requiring high performance or multi-protocol
Ease of use vs. Lustre/GPFS
Unlimited scalability



Where to Position

HPC & AI workloads
Workloads with GPUs
Petabyte scale usable capacity

Object Storage Powered by Cloudian: Exabyte Scale Secondary Storage



Strengths

Low \$/GB
Immutable object storage
Global namespace



Why to Position

Ransomware protection
Exabyte scale for object
Distributed datasets



Weaknesses

Limited file capability
Large minimum configuration size



Where to Position

Geographically distributed workloads
Media streaming
Object only workloads

ThinkSystem DM Series: Feature Rich Unified Storage



Strengths

Unified block, file, object
Industry leading data management features
Flash & hybrid offerings



Weaknesses

High value flash pricing – max performance
Less scale than SDS offerings



Why to Position

Integrated ransomware protection
Industry leading features + all-flash performance
Sub-millisecond latency



Where to Position

Data center/storage consolidations
Mixed workload environments
Tier 0/1 workloads
Primary storage with DG Series

ThinkSystem DG Series: Unified AFA for the Cost of Hybrid



Strengths

Unified block, file, object
Industry leading data management features
QLC economics



Weaknesses

QLC performance vs traditional all-flash arrays
No entry configs
Less scale than SDS offerings



Why to Position

Better performance than hybrid for similar cost
Integrated ransomware protection
Ideal HDD consolidation platform



Where to Position

HDD/hybrid replacement
Data center consolidation
AI & Data lakes
Secondary storage with DM Series

ThinkSystem DE Series: Industry Leading Block Performance



Strengths

Lowest acquisition cost and \$/GB
Simple installation and management
High performance block



Weaknesses

Limited data management features
Max scale: 2PB
Block only protocols



Why to Position

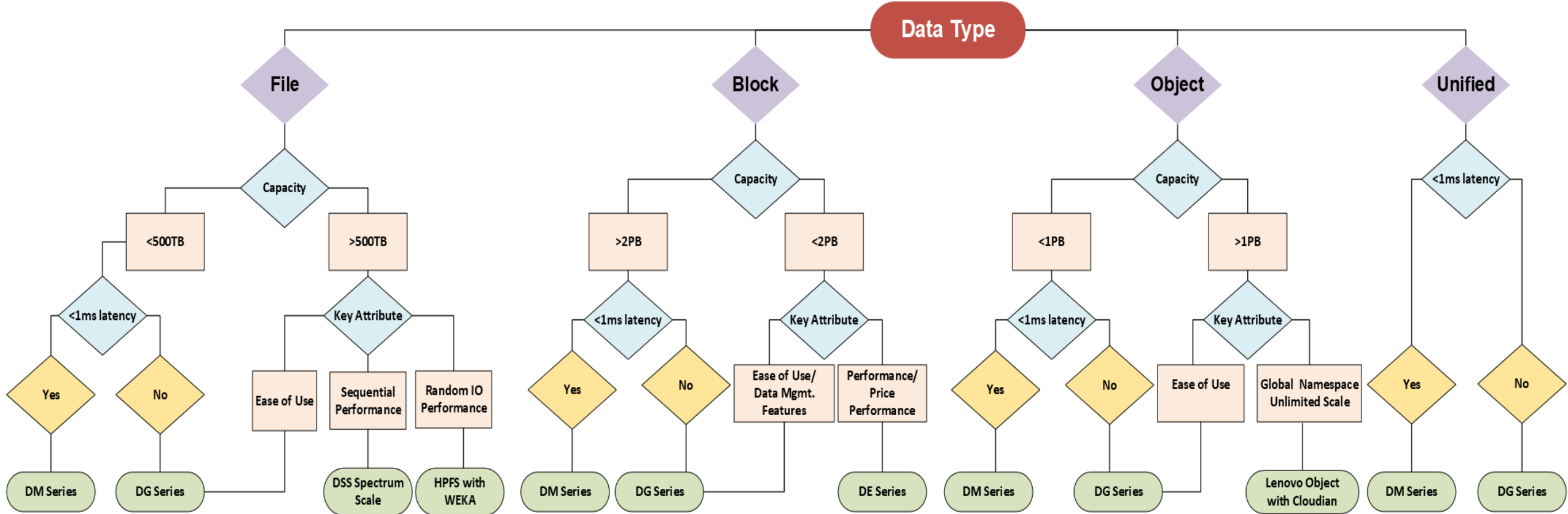
Application provides storage features
No storage specialists/all IT generalists
Price/performance is key metric



Where to Position

Small data footprint
Single workload storage
Block only workloads

Product Recommendation Flowchart



Lenovo DB Series SAN Storage Solutions



ThinkSystem Storage

- Efficient all flash data consolidation
- Unified File/Block/Object
- All-Flash at HDD economics
- Secure hybrid cloud management
- Integrated ransomware protection



Brocade
GEN6
FIBRE CHANNEL



DB610S



DB620S



DB630S

Brocade
GEN7
FIBRE CHANNEL



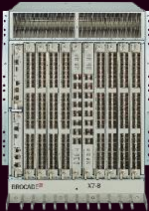
DB720S



DB730S



Directors





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**Рахмет!
Спасибо!**

thanks.

**Smarter
technology
for all**

Lenovo