ClearTechnologies™

Flexibility & Security for SAP HANA

Why Infrastructure Matters

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28
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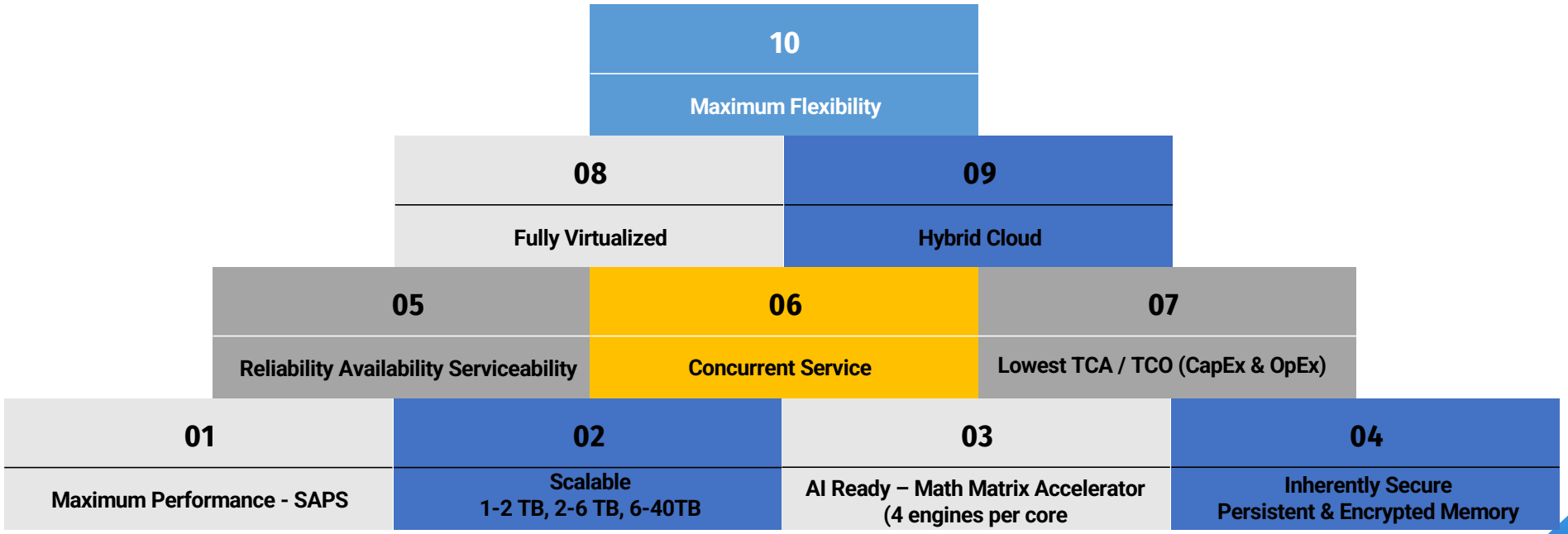
Trusted Advisor

https://www.cleartechnologies.net/sap/

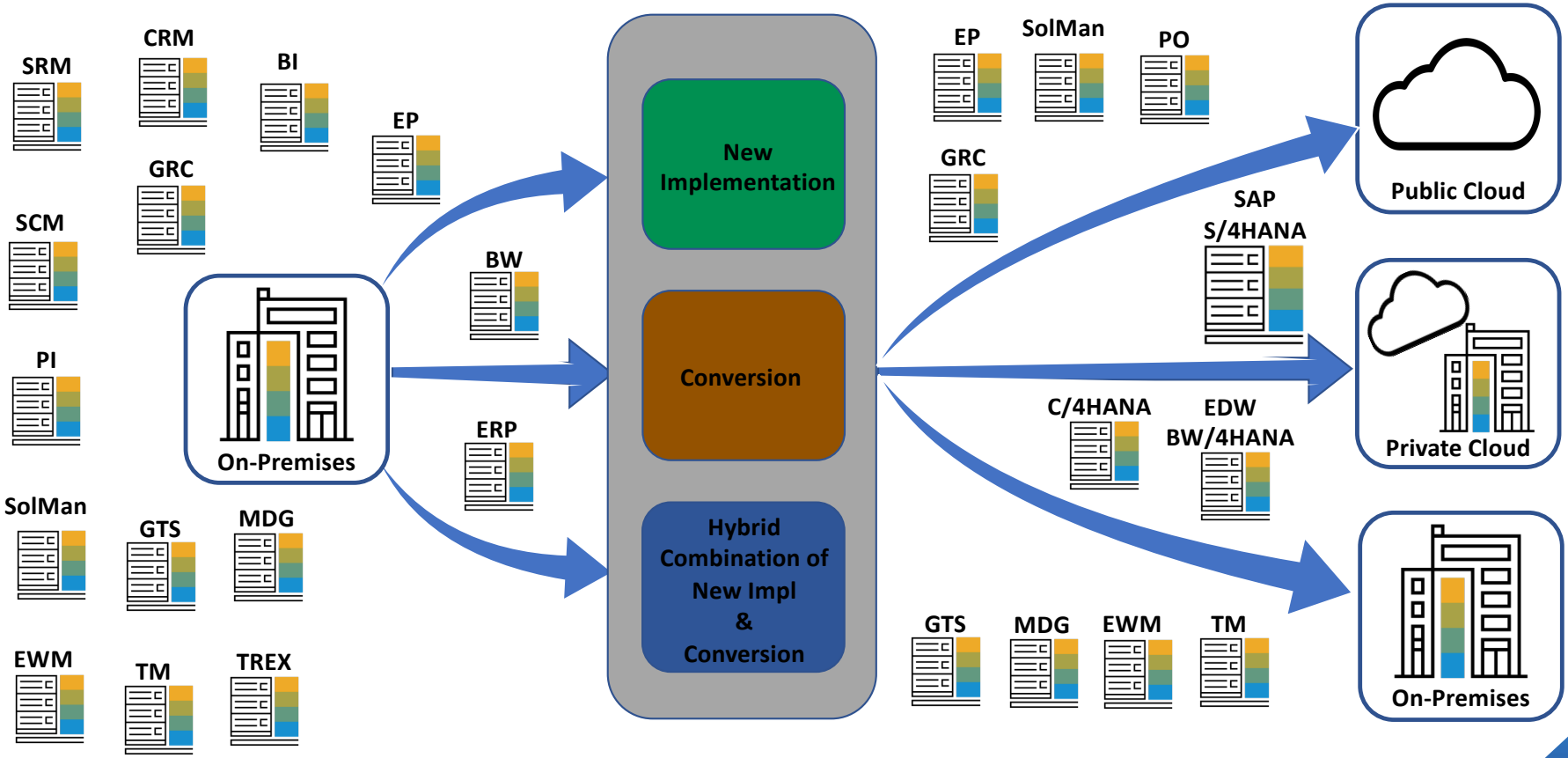
Passionate evangelist for Enterprise Compute, Storage & Software technologies. Recognized specialist in software cost reduction and competitive selling. Focus over the past 12 years has been on Architecture & Solution Design for clients running large, complex ERP environments.

https://www.linkedin.com/in/murphy-brett/

What is a Desirable End State



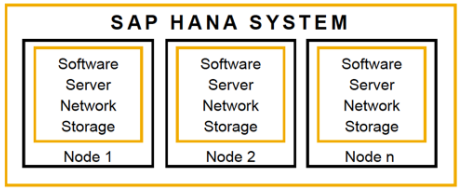
SAP Big Picture



Scalability & Flexibility

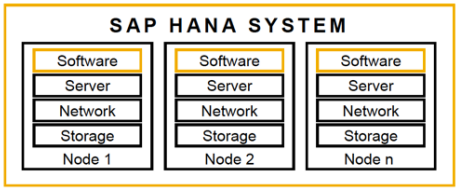
Two deployment options to choose from

Appliance



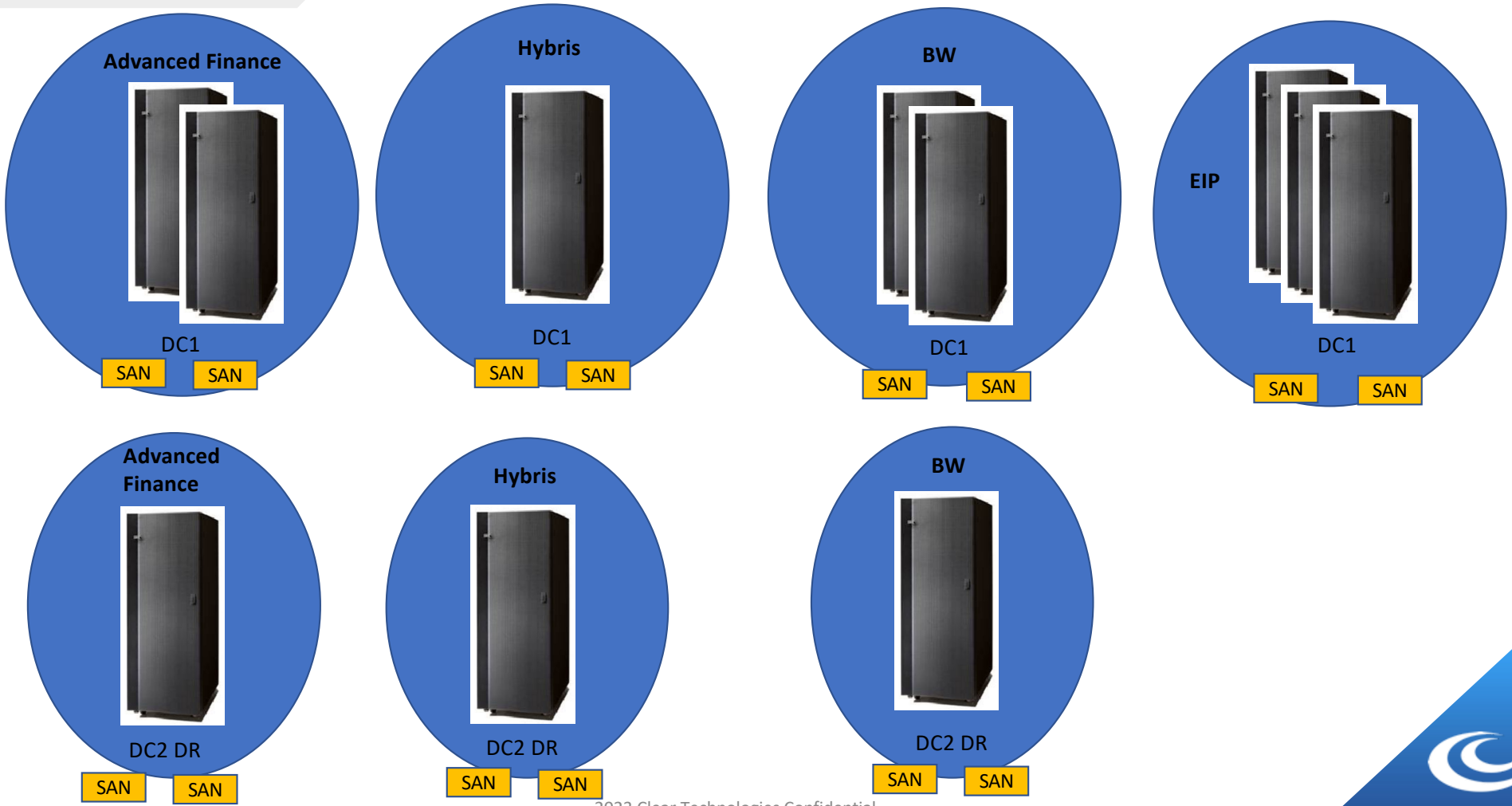
All-in one box certified partners
(1,100+ configurations – 64GB to 24TB)

Tailored Data Center Integration

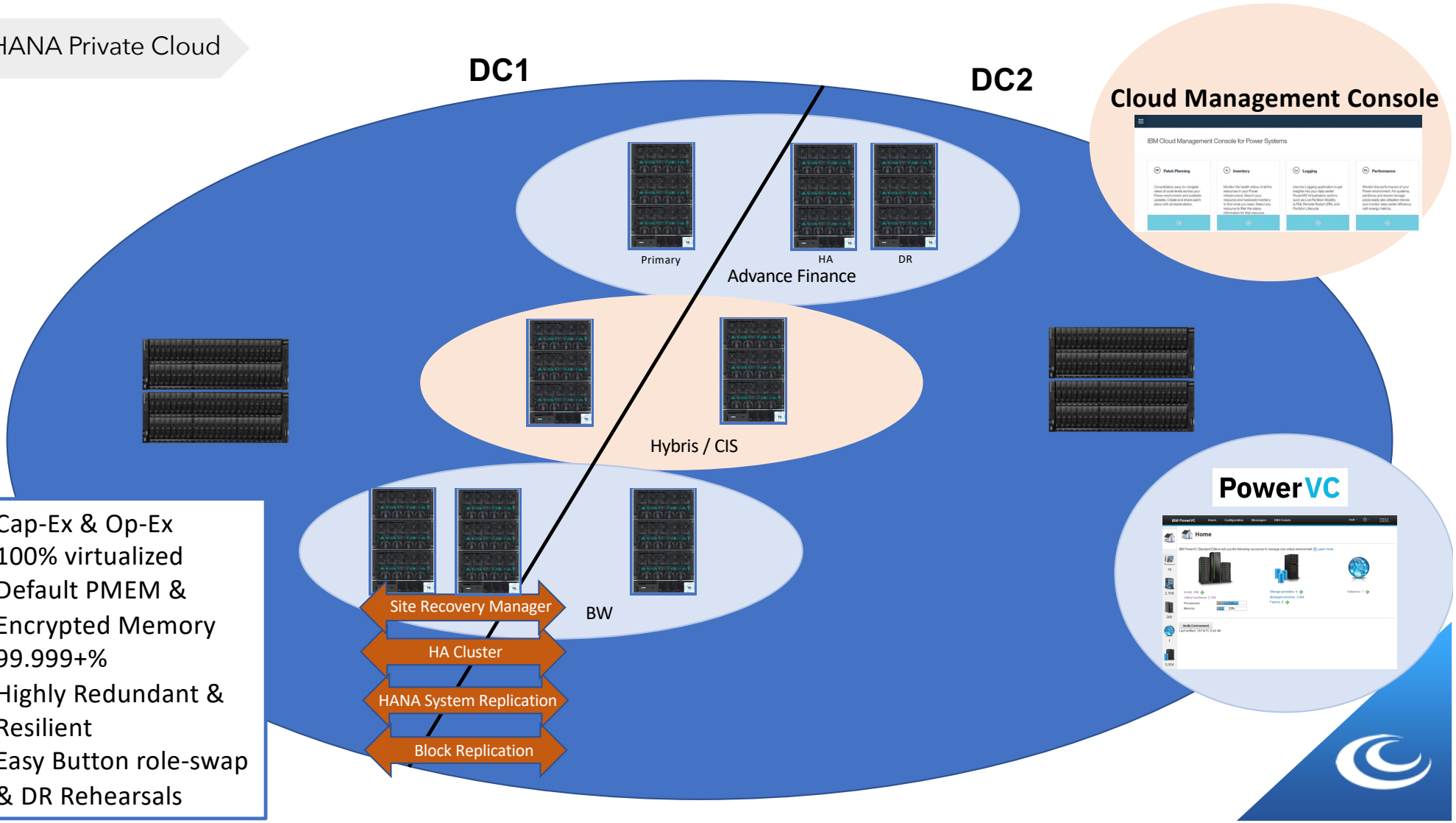


Choice of components that meet SAP requirements from different vendors

Previous Compute Islands

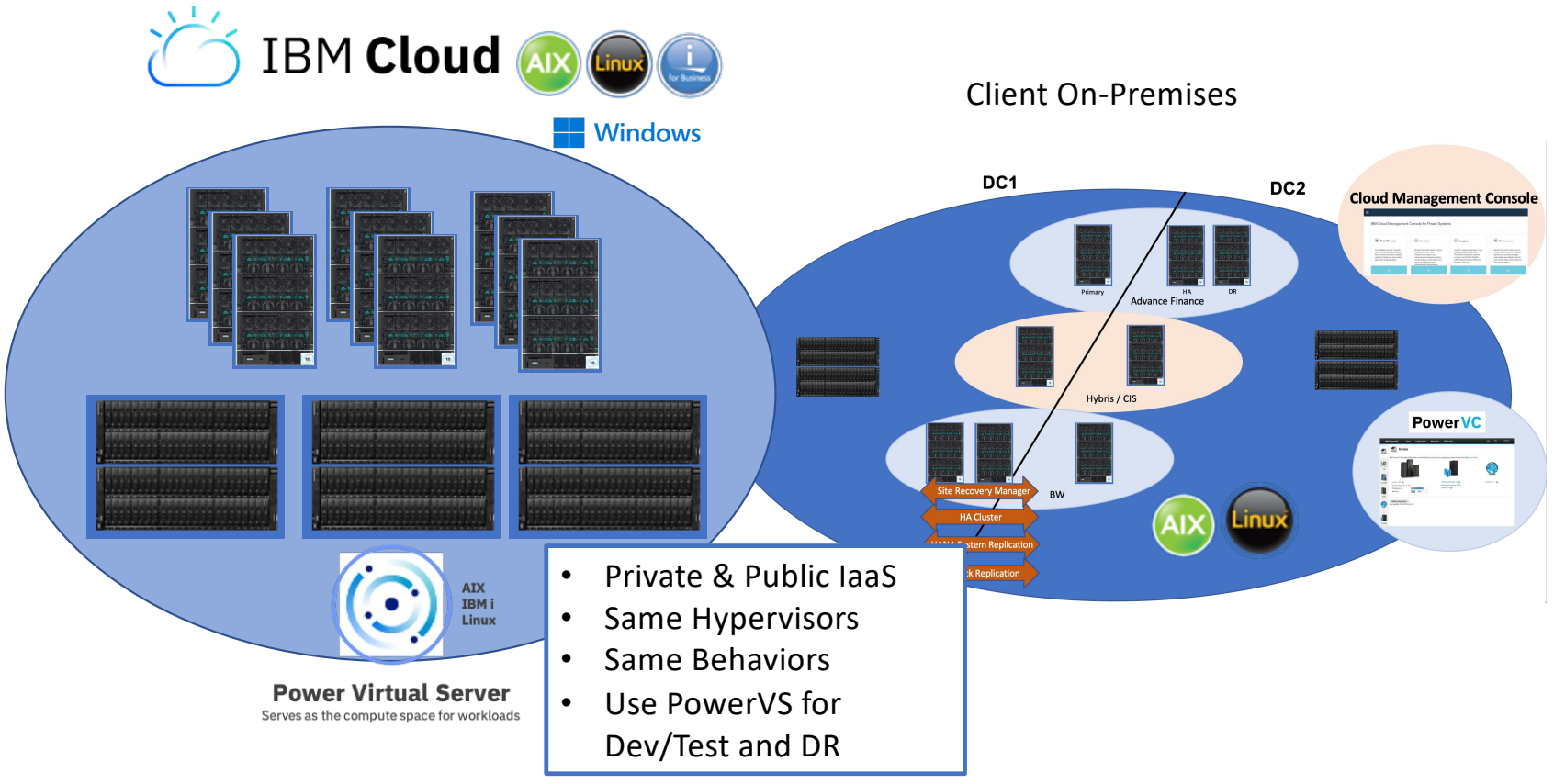


HANA Private Cloud



- Cap-Ex & Op-Ex
- 100% virtualized
- Default PMEM & Encrypted Memory
- 99.999+%
- Highly Redundant & Resilient
- Easy Button role-swap & DR Rehearsals

Hybrid Cloud Flexibility



- Private & Public IaaS
- Same Hypervisors
- Same Behaviors
- Use PowerVS for Dev/Test and DR

Power v … - Comparison

What's Different

Reliability – Enhanced availability through redundancy and enterprise memory

Scalability – Support up to 40TB memory in a single instance

Flexibility – Adjust sizing on the fly with no downtime

Performance – World record benchmarks and 2X+ > SAPS & memory bandwidth

Virtualization – Always on and fully supported on Power with no performance impact

Security – Built-in Security extends to Storage

What's The Same

SAP Itself – SAP Code does not change across platforms

Operating System – RedHat or SUSE

Management Tools – Chef, Ansible, OpenStack, and more!

Application / Database Skills

IBM Power

Visit us: https://www.ibm.com/it-infrastructure/power

Watch "The Legacy and Future of IBM POWER with IBM POWER10"

SAP HANA EXCELLENCE

Best SAP Performance **2.7x**

Per core performance of 8-socket E1080 two-tier SAP SD benchmark compared to best x86 8-socket HPE Superdome Flex

Largest Customers **45**

of America's top 50 largest revenue generating companies are active Power customers

Most Reliable **>=99.999%**

Availability rating in ITIC survey of 1,200 corporations across 28 vertical markets

SAP on Power **40TB**

Largest certified Memory instance

SAP on Power **>4,500**

SAP HANA on Power customers

Highly Secure **<0.013%**

Security vulnerabilities in PowerVM hypervisor compared to VMware

SAP on Power **16 LPARs**

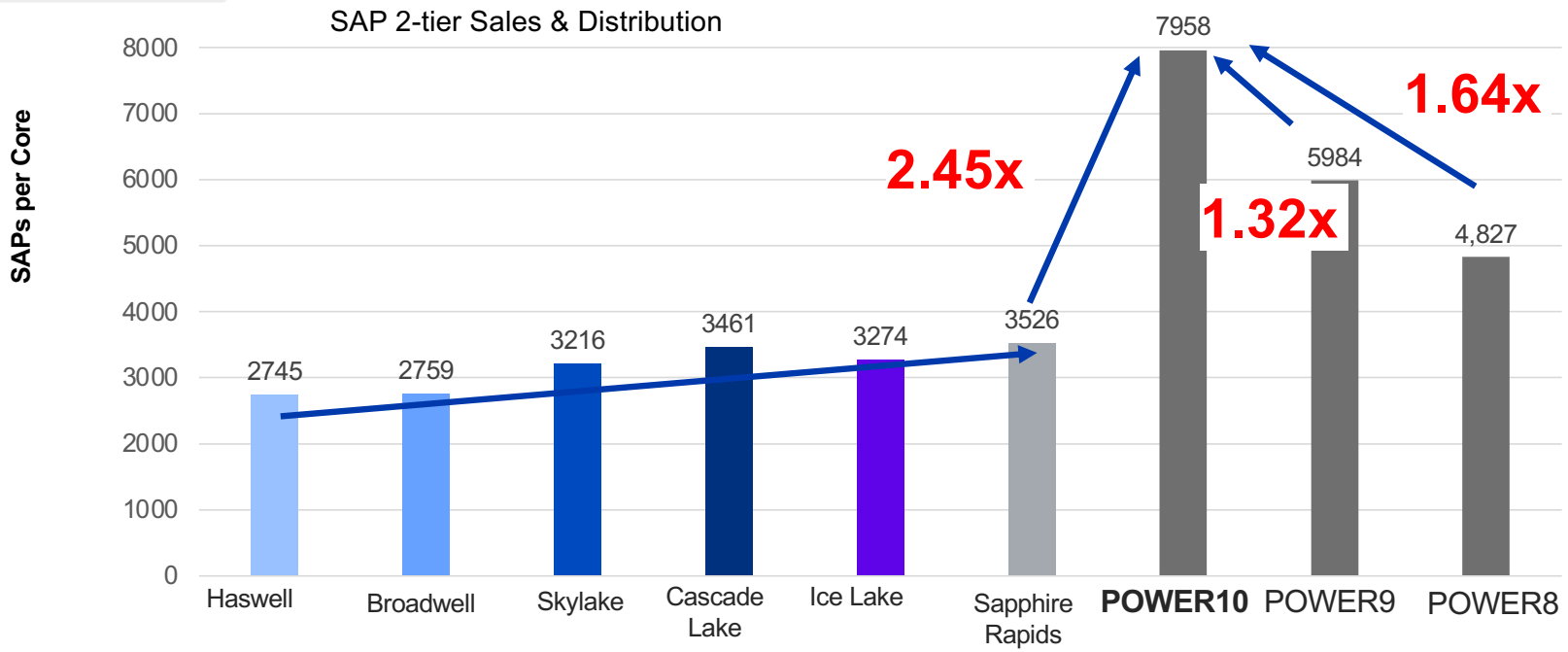
Highest # of production virtual partitions

SAP on Power **>70**

SAP HANA on Power Public References

SAP SD Benchmarks

Power Systems continuously improves per core performance



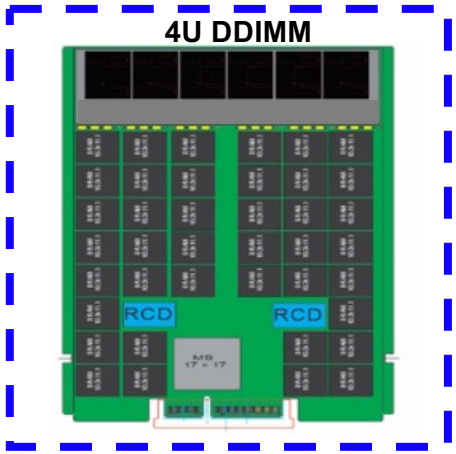
- **World record 8-socket performance**
- **More performance per core**
  - **4X vs 16-socket Intel[1]**
  - **2.7X vs 8-socket Intel[2]**

Source: https://www.sap.com/dmc/exp/2018-benchmark-directory/#/sd

1. Google Cloud Platform; two-tier SAP SD standard application benchmark running SAP ERP 6.0 EHP5 (cloud); Intel Xeon Platinum 8280L 2.7 GHz, 16p/448c/896t, 157,000 SD benchmark users (892,270 SAPS), running Windows Server 2019 and Microsoft SQL Server 2017, Certification # 2021008.
2. HPE Superdome Flex; two-tier SAP SD standard application benchmark running SAP ERP 6.0 EHP5; Intel Xeon Platinum 8380H 2.9 GHz, 8p/224c/448t, 122,300 SD benchmark users (670,830 SAPS), Windows Server 2016 and Microsoft SQL Server 2012, Certification # 2021006.

IBM Power Memory Performance

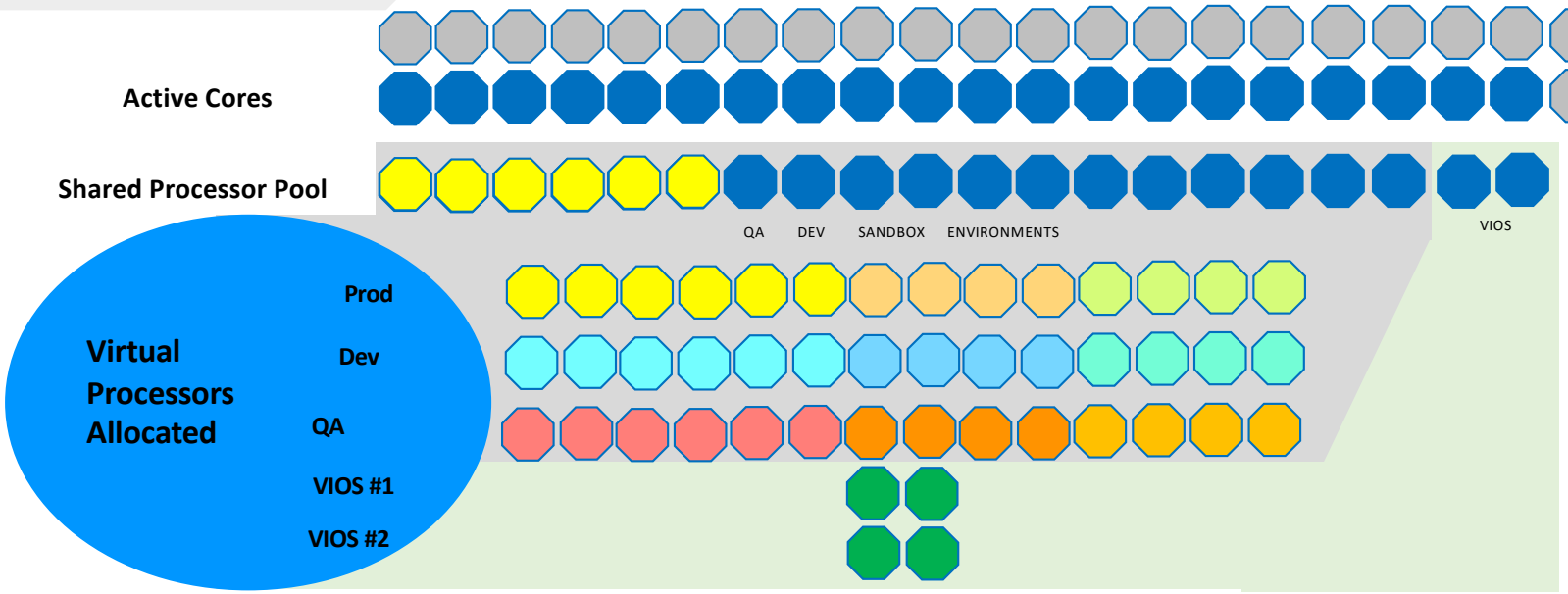
With SAP HANA being an in-memory database, system memory is crucially important in keeping your SAP application running 24x7



Providing higher bandwidth and flexibility for future memory technologies
Full memory encryption for added security

- 2X better memory RAS than industry standard DIMMs[1]
- 2.4X higher memory bandwidth than scalable x86 processors
- DDR4 running at up to 3200 Mbps data rate provides 409 GB/s peak memory bandwidth per socket
- Transparent memory encryption with no additional management setup and no performance impact
- Chipkill technology with advanced ECC protects from memory chip failure - plus spare
- Active Memory Mirroring (AMM) feature supported - Mirrors hypervisor memory to provide resiliency from uncorrectable memory errors

IBM Power Flexibility



Power10 Server
48 cores
20 cores active
8192 GB RAM

Prod *DB-1* 6 VP – 512 GB	Dev *DB -1D* 6 VP – 48 GB vPMEM	QA *DB-1Q* 6 VP – 64 GB	VIOS 2 VP – 16 GB	VIOS 2 VP – 16 GB
Prod *DB-2* 4 VP – 96 GB	Dev *DB-2D* 4 VP – 32 GB	QA *DB-2Q* 4 VP – 48 GB		
Prod *DB-3* 4 VP – 06 GB	Dev *DB-3D* 4 VP – 32 GB	QA *DB-3Q* 4 VP – 48 GB		

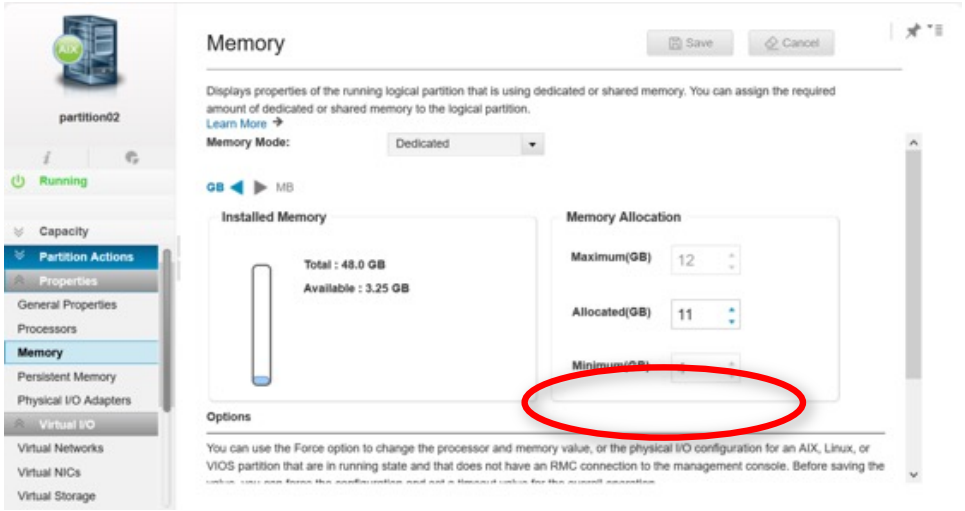
Infrastructure Granularity

LPAR	LPAR Details	Memory in GB	Cores
1	HANA OLAP L	22,528	78
2	HANA OLAP S	14,336	40
3	HANA OLAP S	1,200	5.0
4	HANA OLAP M	1,440	8.0
5	HANA OLTP1 High Priority	12,288	36
6	HANA OLTP2 Low Priority	960	4.0
7	App-Server 1	320	8.0
8	App-Server 2	320	8.0
9	App-Server 3	320	8.0
10	App-Server 4	320	8.0
11	test1	128	2.0
12	test2	512	2.0
13	test3	256	4.0
14	test4	128	4.0
15	demo	256	5.0
	Total Resources Required	55,042	220

Acts the same …
Behaves the same …

On-Premises &
Hybrid Cloud!

Memory Flexibility



SAP HANA now supports changing the memory size *without* restarting SAP HANA

DLPAR Memory ***add*** and ***remove*** on the HMC allows you to change the **memory** allocated to an LPAR ***dynamically*** in the range of Min and Max as defined in the LPAR profile without restarting the LPAR

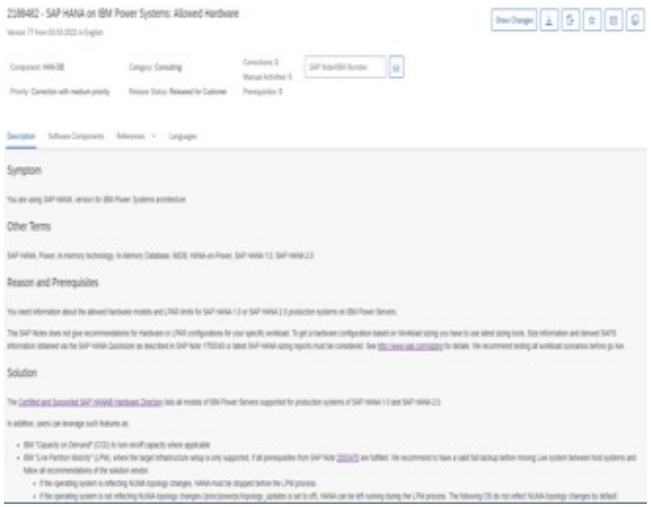
See SAP Note 3114051 for more details

IBM "*Dynamic LPAR*" (DLPAR) operation to add memory to or remove memory from a running LPAR on POWER9

- LPARs must use HANA 2.0 SPS05 revision 52 (or newer) and SLES 15 SP2 or RHEL 8.3
- Use a DLPAR operation to adjust memory if you immediately need more memory to fulfill a critical business task, and shutting down the SAP HANA system is not possible.

- When adding or removing memory permanently to or from an LPAR it is required to verify the sizing of the target configuration to ensure it still satisfies the workload requirements for that LPAR. If the new configuration does not satisfy the workload demand, then corrective actions need to be taken.

IBM Power HANA Support



BW on HANA and BW/4HANA (OLAP Workloads):

ScaleUp: 40 TB

ScaleOut: 16 x 32 TB = 512 TB

Suite on HANA and S/4HANA (OLTP & Mixed Workloads):

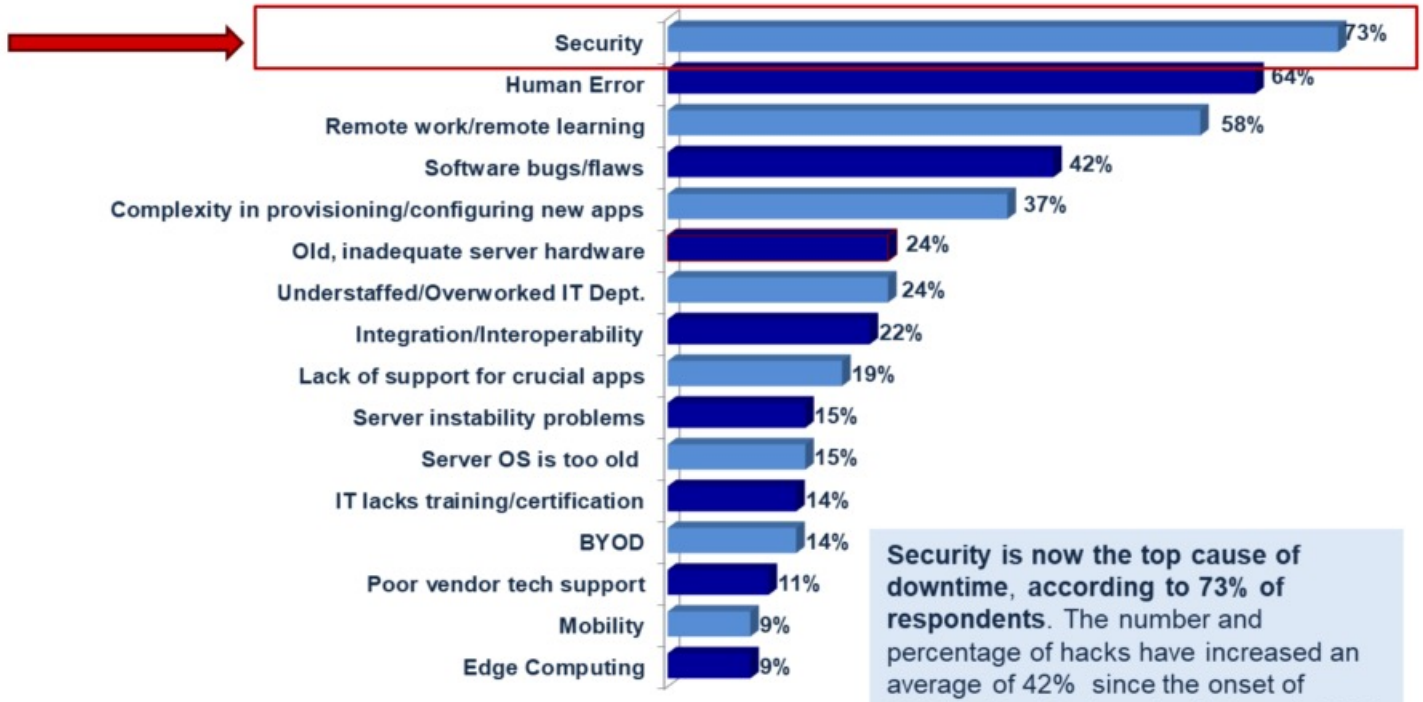
ScaleUp: 32 TB

ScaleOut (S/4HANA only): Min. 2 x 6 TB up to 4 x 32 TB = 128 TB

10 **IBM Power models supported with production HANA**

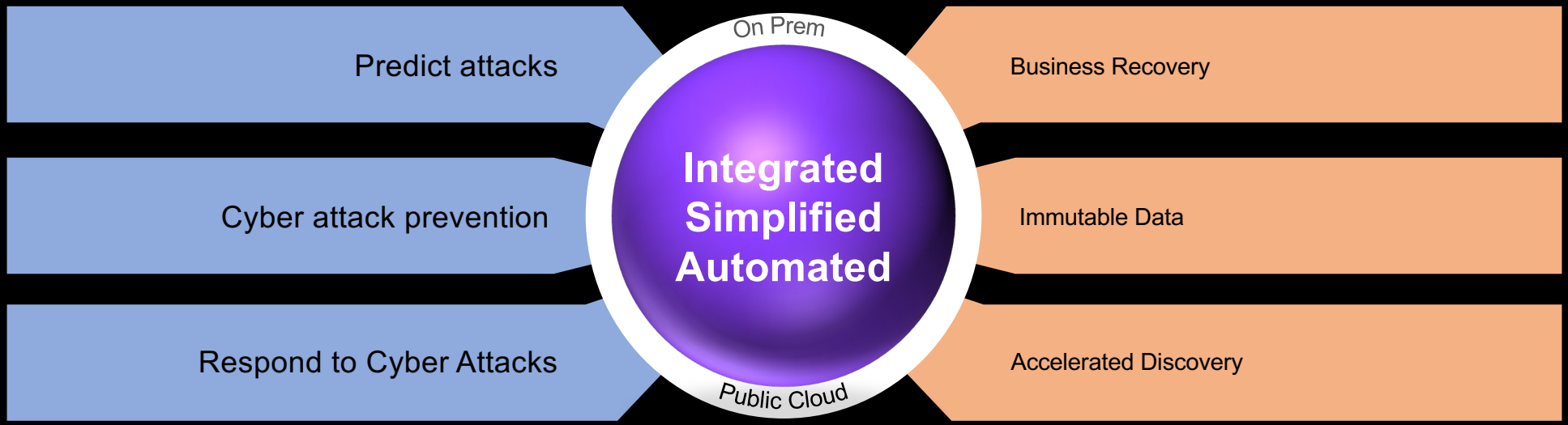
- E1080
  - Up to 240 cores, 40 TB OLAP & 32 TB OLTP
  - Up to 16 production LPARs
- E1050:
  Up to 96 cores, 16 TB
  Up to 8 production LPARs
- L/S1022, L/S1024:
  Up to 48 cores – 8 TB
  Up to 4 production LPARs

What Issues Most Negatively Impact Reliability & Cause Downtime for Server hardware, Server OS in 2022? (Select all that apply)



Security is now the top cause of downtime, according to 73% of respondents. The number and percentage of hacks have increased an average of 42% since the onset of COVID-19 global pandemic in early 2020

Be Ready for ANYTHING



Why Act Now?


CYBER ATTACKS
Ransomware attacks increased 95% in 2021
RANSOMWARE
"time to ransom" dropping to a matter of hours
CYBER WARFARE
Complete data wipe (production & backups) No ability to recover
INCREASING THREATS

IBM Power Security

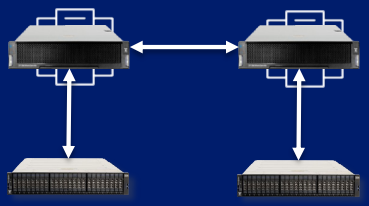
- ✓ Enhanced end-to-end security, co-optimized with PowerVM
- ✓ Built-in security features at all layers in the stack (i.e., processor, memory, systems, firmware, OS, and hypervisor).
- ✓ Default & no-cost transparent encryption on all Power10 systems
- ✓ PowerSC – Compliance & Drift Analysis, FIM, EDR, MFA, Patch Managmenet, Trusted Boot/Firewall/Logging
- ✓ Cybersecurity (Transparent memory encryption, 4x crypto engines (in-core & on-chip), ready for quantum-safe cryptography)
- ✓ 100X fewer security vulnerabilities than VMware

Protect data from core to cloud

- On-chip & in-core crypto engines
- Support for Quantum safe cryptography and Fully Homomorphic Encryption
- AES/SHA/SHA2/SHA3 cryptography, on-chip NX (Nest Accelerator) unit
- Advanced protection for ROP attacks

Data Resilience

Enhanced High-availability
Zero RPO/RTO



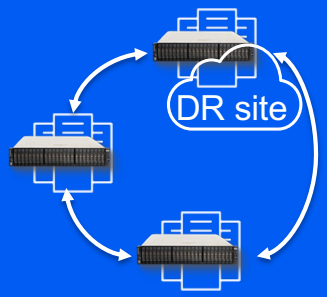
Multi-Platform Support

Pure HPE IBM
Dell/EMC NetApp 500+ others…

HyperSwap
Zero RPO/RTO

100% data availability guarantee

Enterprise Disaster Recovery
>Zero RTO



2-site and 3-Site Options
Can be combined with HyperSwap

Protection from failures and disasters

SafeGuarded Copy

CyberVault

AES encryption and in-line compression

50us Latency

Protecting SAP HANA with the IBM Storage Portfolio

IBM recommends a comprehensive plan for protecting your SAP HANA databases

IBM Storage Defender → Advanced Threat Detection
Automated Data Resilience
Integrate w/ Existing Tools

IBM Storage Copy Data Management → Creates and manage primary storage hardware snapshots

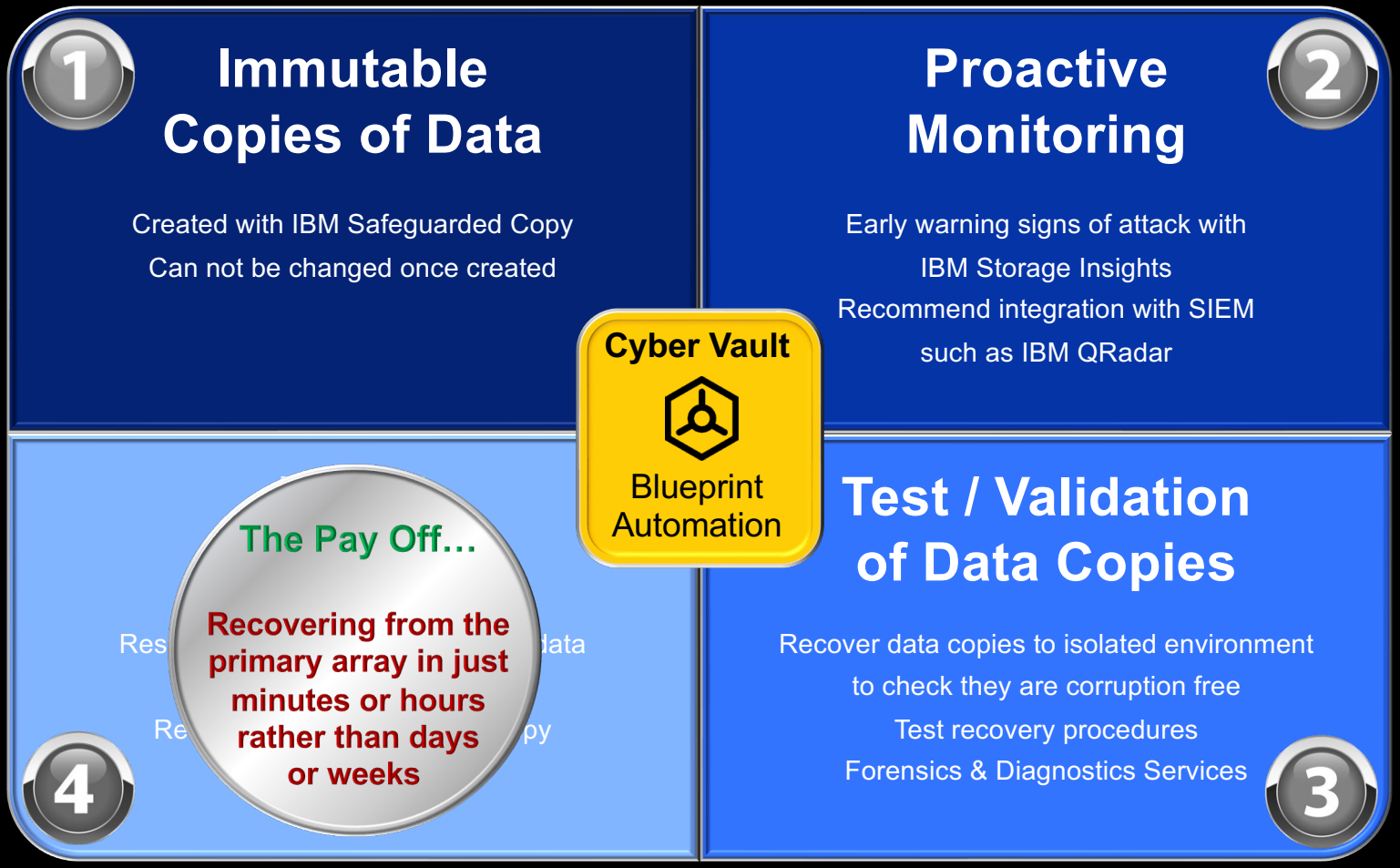
IBM Storage Sentinel for SAP HANA → Creates immutable snapshots and scans them for Ransomware

Object / Cloud

Tape

Disk/Flash

The real purpose behind Cyber Vault



Take the Cyber Resilience Assessment Today

The Cyber Resiliency Assessment Template (CRAT) provides a way to evaluate the current data resilience of the organization, identifies strengths and weaknesses and provides recommendations to **build an effective cyber resilience plan**.

[IBM Cyber Resiliency Assessment]

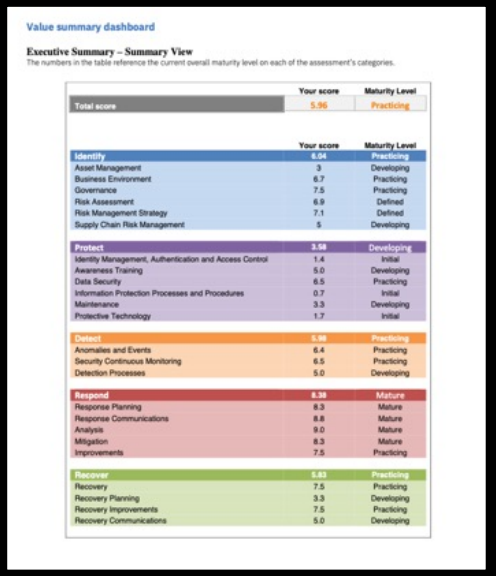

Storage Cyber Resiliency & Disaster Recovery Assessment Report

IBM Security & Resilience

January 5, 2021

Overview

Executive summary

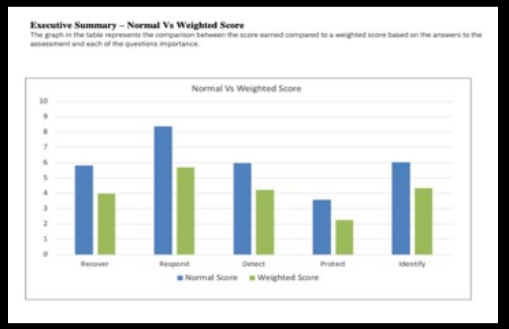

Value summary dashboard

Executive Summary – Summary View

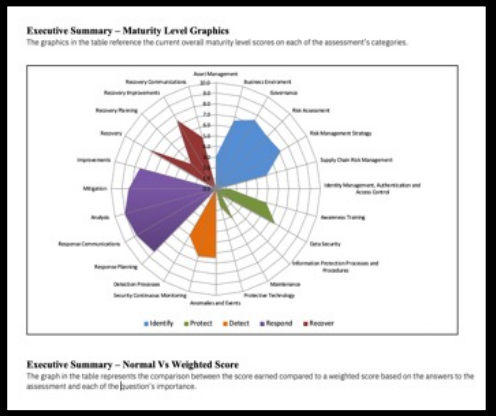
The numbers in the table reference the current overall maturity level on each of the assessment's categories.

	Your score	Maturity Level
Total score	5.96	Practicing

	Your score	Maturity Level
Identify	6.04	Practicing
Asset Management	3	Developing
Business Environment	6.7	Practicing
Governance	7.5	Practicing
Risk Assessment	6.9	Defined
Risk Management Strategy	7.1	Defined
Supply Chain Risk Management	5	Developing
Protect	5.58	Developing
Identity Management, Authentication and Access Control	1.4	Initial
Awareness Training	5.0	Developing
Data Security	6.5	Practicing
Information Protection Processes and Procedures	0.7	Initial
Maintenance	3.3	Developing
Protective Technology	1.7	Initial
Detect	5.98	Practicing
Anomalies and Events	6.4	Practicing
Security Continuous Monitoring	6.5	Practicing
Detection Processes	5.0	Developing
Respond	8.38	Mature
Response Planning	8.3	Mature
Response Communications	8.8	Mature
Analysis	9.0	Mature
Mitigation	8.3	Mature
Improvements	7.5	Practicing
Recover	5.83	Practicing
Recovery	7.5	Practicing
Recovery Planning	3.3	Developing
Recovery Improvements	7.5	Practicing
Recovery Communications	5.0	Developing


Executive Summary – Normal Vs Weighted Score

The graph in the table represents the comparison between the score earned compared to a weighted score based on the answers to the assessment and each of the questions importance.


Executive Summary – Maturity Level Graphics

The graphics in the table reference the current overall maturity level scores on each of the assessment's categories.

Executive Summary – Normal Vs Weighted Score

The graph in the table represents the comparison between the score earned compared to a weighted score based on the answers to the assessment and each of the question's importance.

Assessments

No-cost!

SAP HANA Readiness Assessment

Cyber Security Assessment

Storage & Capacity Planning Assessment

Resources

Clear Technologies
https://www.cleartechnologies.net/sap/

ITIC Security Survey Results
https://www.ibm.com/downloads/cas/BGARGJRZ

ITIC Reliability Survey Results
https://www.ibm.com/downloads/cas/VQ5B65Y

SAP Blog – SAP HANA on Power10
https://blogs.sap.com/2023/03/17/sap-hana-on-ibm-power10/

Thank you

Q&A

About Clear Technologies

ClearTechnologies™

- On-premises, Private Cloud and Public Cloud hosting & infrastructure reseller
- SAP Infrastructure Practice
- Managed services
- Hardware, Software & Services focused

visualstorage INTELLIGENCE

- Cloud based storage reporting and analytics
- Heterogenous storage dashboard
- SaaS

Partnership & Trusted Advisor

We are a single point of contact, committed to consistently delivering the solution and services that are the best fit for your business.

- 30-year Value-Added Reseller
- Long history with Systems & Storage
- Strategic focus on SAP, and other innovative solutions
- Extraordinary Net Promotor Score
- Cognitive Leadership Program
- 3 IBM Champions

certified WBENC WOMEN'S BUSINESS ENTERPRISE