

IBM Storage Networking b-type family

GEN7
FIBRE CHANNEL



IBM Gen 7 Solutions

Why building a next-gen Storage Infrastructure is critical for the 2020's

Ken Griffo

IBM, Storage Networking
Business Line Executive

Craig Nelson

Broadcom, Global Sales
Executive

AJ Casamento

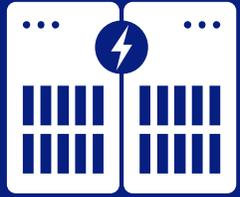
Broadcom, Storage and SAN
Solutioneer

It's 2020

**Unprecedented &
Uncertain Times**

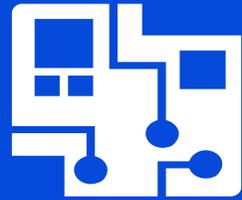
**How Do I Architect
the Data Center for
the Future?**

2020 Realities of the Storage Infrastructure



>Flash

over 70% of enterprise storage arrays are all-flash



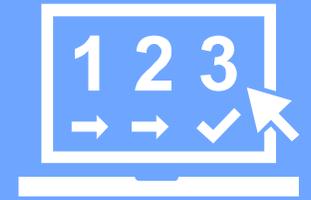
>NVMe

is becoming a requirement for storage in 2020



>Agile

infrastructure must support multiple protocols, seamless migration and next-gen workloads



>Simple

IT needs simpler management, analytics, and automated capabilities

PERFORMANCE

MANAGEMENT

Specific Needs of the On-Demand Data Center



Drive New Levels of Performance



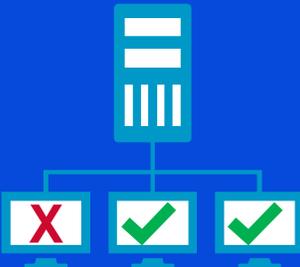
Monitor Application Performance



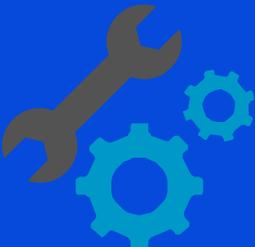
Identify Network Congestion



Prioritize Types of Traffic



Isolate Configuration Errors



Identify Misbehaving Devices

Specific Needs of the On-Demand Data Center

These requirements
can't be met without
INTELLIGENT
AUTOMATION

Drive New Levels of
Performance

Monitor Application
Performance

Identify Network
Congestion

Apps

Prioritize Types
of Traffic

Isolate Configuration
Errors

Identify Misbehaving
Devices

**How does this
impact the storage
infrastructure?**

IBM Provides A Simplified Modern Storage Family

FS5000



Cost efficient
Entry Enterprise

FS5100

Certified **NVME** end-to-end

32 Gb



NVMe for
Entry Enterprise

FS7200

Certified **NVME** end-to-end

32 Gb



Mid-range
Enterprise NVMe

FS9200

Certified **NVME** end-to-end

32 Gb



High-end
Enterprise NVMe

FS9200R

Certified **NVME** end-to-end

32 Gb



Heterogeneous
Virtualization

IBM Spectrum Virtualize



DS8900F

32 Gb

High End
Server
zOS
Power HA



Enterprise
Replication

SAN Volume Controller

Certified **NVME** over FC

32 Gb

Heterogeneous
Virtualization

← IBM b-type Storage Networking supports 32 Gb/s, NVMe, FICON, and Extension →

Storage/Tape Extension Solutions

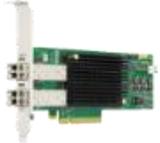


SAN18B-6



SAN42B-R

Fibre Channel Adapters & Storage

IBM SANnav Management



Global View



Management Portal

32 Gb/s

Certified **NVME** TODAY



SAN24B-6



SAN64B-6



SAN128B-6



SAN256B-6



SAN512B-6

GEN6
FIBRE CHANNEL

IBM Provides A Simplified Modern Storage Family

<p>FS5000</p>  <p>Cost efficient Entry Enterprise</p>	<p>FS5100</p> <p>Certified NVMe end-to-end</p> <p>32 Gb</p>  <p>NVMe for Entry Enterprise</p>	<p>FS7200</p> <p>Certified NVMe end-to-end</p> <p>32 Gb</p>  <p>Mid-range Enterprise NVMe</p>	<p>FS9200</p> <p>Certified NVMe end-to-end</p> <p>32 Gb</p>  <p>High-end Enterprise NVMe</p>	<p>FS9200R</p> <p>Certified NVMe end-to-end</p> <p>32 Gb</p>  <p>Heterogeneous Virtualization</p>	<p>DS8900F</p> <p>32 Gb</p> <p>High End Server zOS Power HA</p>  <p>Enterprise Replication</p>
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SAN Volume Controller



Certified NVMe over FC

32 Gb

IBM b-type Storage Networking supports 32 Gb/s, NVMe, FICON, and Extension

Storage/Tape Extension Solutions



SAN18B-6 SAN42B-R



Fibre Channel
Adapters &
Storage

IBM SANnav Management



Global View Management Portal

32 Gb/s

Certified NVMe TODAY



SAN24B-6 SAN64B-6 SAN128B-6 SAN256B-6 SAN512B-6

32/64 Gb/s

Certified NVMe TODAY



SAN64B-7 SAN256B-7 SAN512B-7

GEN6
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**How can
Gen 7 SAN help?**

To build the best infrastructure in the next 12-18 months to prepare for the Next Decade, you need ...



Latency

50% lower latency

To build the best infrastructure in the next 12-18 months to prepare for the Next Decade, you need ...



Bandwidth

64Gb/s = Greater Scalability

To build the best infrastructure in the next 12-18 months to prepare for the Next Decade, you need ...



Intelligent Analytics
Optimize Perf, Increase Reliability

To build the best infrastructure in the next 12-18 months to prepare for the Next Decade, you need ...



Automated Resiliency

Resolve issues without intervention

To build the best infrastructure in the next 12-18 months to prepare for the Next Decade, you need ...



AUTONOMOUS SAN



Autonomous SAN

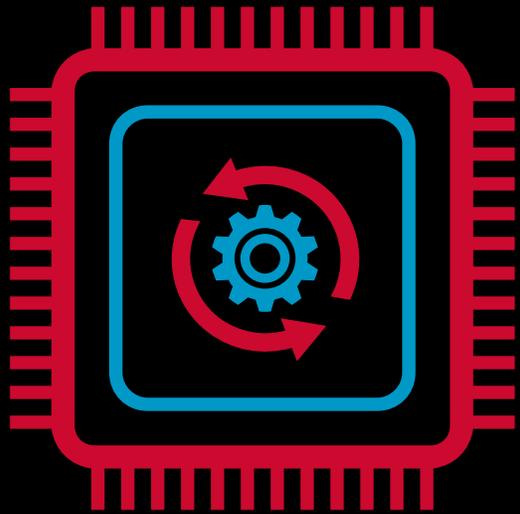
Performance & Intelligent Automation

The Autonomous SAN – Eliminate Complexity and Save Money



**What Architecture
allows Autonomous
SAN features?**

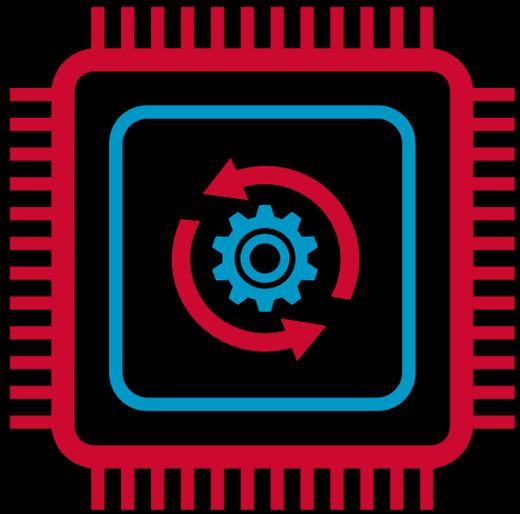
The Autonomous SAN Architecture



Condor 5 ASIC

2X bandwidth, 50% lower latency &
50% more buffers

The Autonomous SAN Architecture



Integrated Sensors

Comprehensive telemetry data at ASIC

The Autonomous SAN Architecture



Powerful Analytics

Creates baselines & identifies issues

The Autonomous SAN Architecture

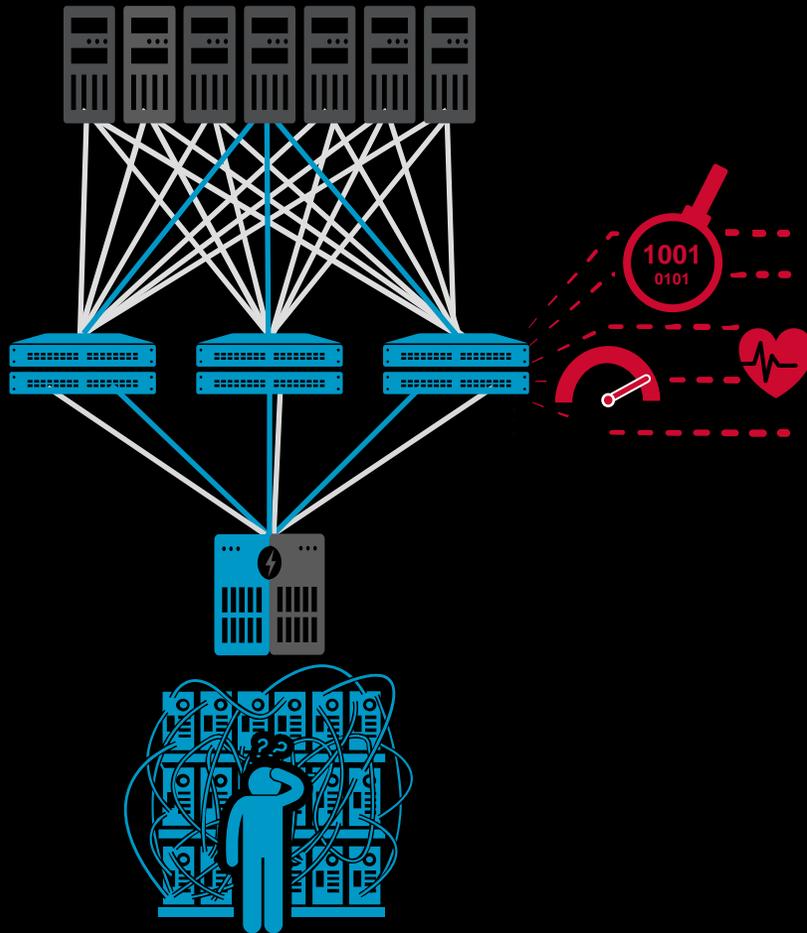


Advanced Automation

Mitigate issues & prioritize traffic streams

**What are examples
how Autonomous
SAN help Admins?**

Self Learning: Automatically Discover Application Flows



Switches ▾ Flows ISL Trunks ▾ Collections (8) All ▾ Flow Collections ▾

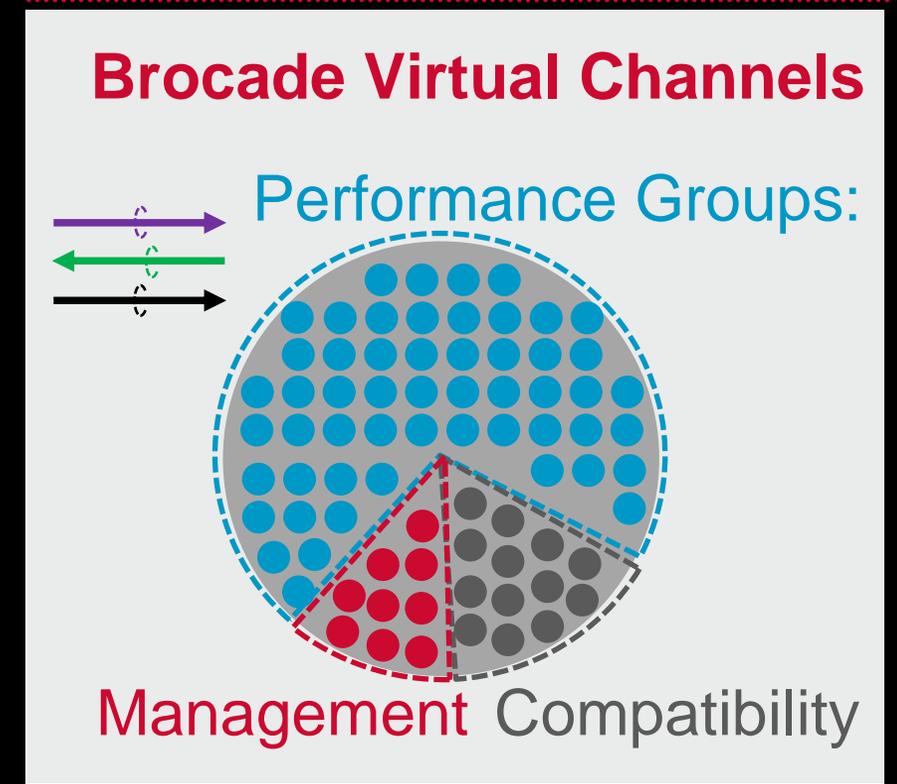
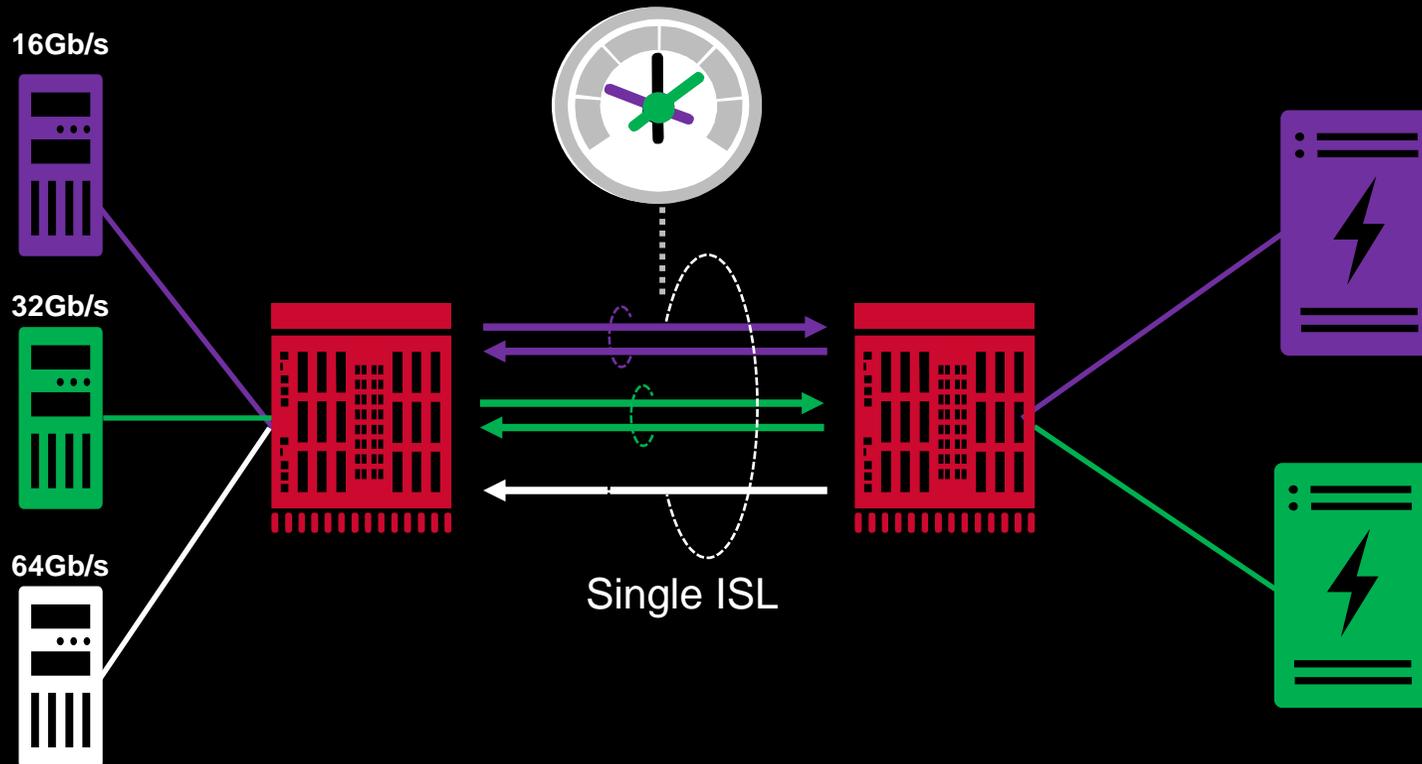
Name ▾	Description ▾	Total Flows ▾	Active Flows ▾	RD ECT (ms) ▾	WR ECT (ms) ▾	RD FRT (ms) ▾	WR FRT (ms) ▾	RD IOPS ▾	WR IOPS ▾	RD Rate (MB/s) ▾	WR Rate (MB/s) ▾	
+ ESX87	-	48	48	0.309	0.466	0.186	0.174	35741	28312	1805.032	1341.013	▾
+ ESX130	-	408	408	0.302	0.763	0.256	0.087	36186	36186	1133.974	1133.973	▾
+ FID50	-	16	16	0.562	0.53	0.103	0.098	10029	10040	1254.191	1255.564	▾
+ PIO	-	16	16	-	1.178	-	0.406	-	27636	-	1505.174	▾
+ ROS	-	4	4	1.441	-	0.852	-	6476	-	490.149	-	▾
+ SDD	-	8	8	0.173	-	0.043	-	8992	-	562.135	-	▾
+ UCS	-	32	32	4.979	-	0.846	-	19072	-	1192.223	-	▾
+ Z3031	-	8	8	0.305	0.365	0.126	0.086	11696	11696	1462.391	1462.332	▾

- Simplify monitoring and management of application traffic by aggregating all of the traffic flows together
- Apply custom MAPS policies to the collection
- Display aggregated metrics for each flow collection
- Troubleshoot the collection made up of distributed flows and drill down to the individual flow of interest

Self Optimizing: Traffic Optimizer

Guarantee application performance by prioritizing and grouping traffic

- Automatic traffic classification to Performance Group by destination port speed
- Eliminate common oversubscription and congestion issues caused by mismatched speed
- Enabled by default on all Gen 7 platforms and FC32-X7-48 blade
- Backward compatible with Gen 6 platforms in a mixed environment



Self Healing: Congestion Notification

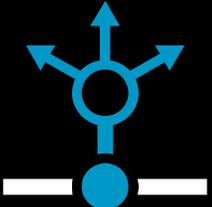
Ensure data Delivery with Automatic Failover From Physical or Congestion Issues



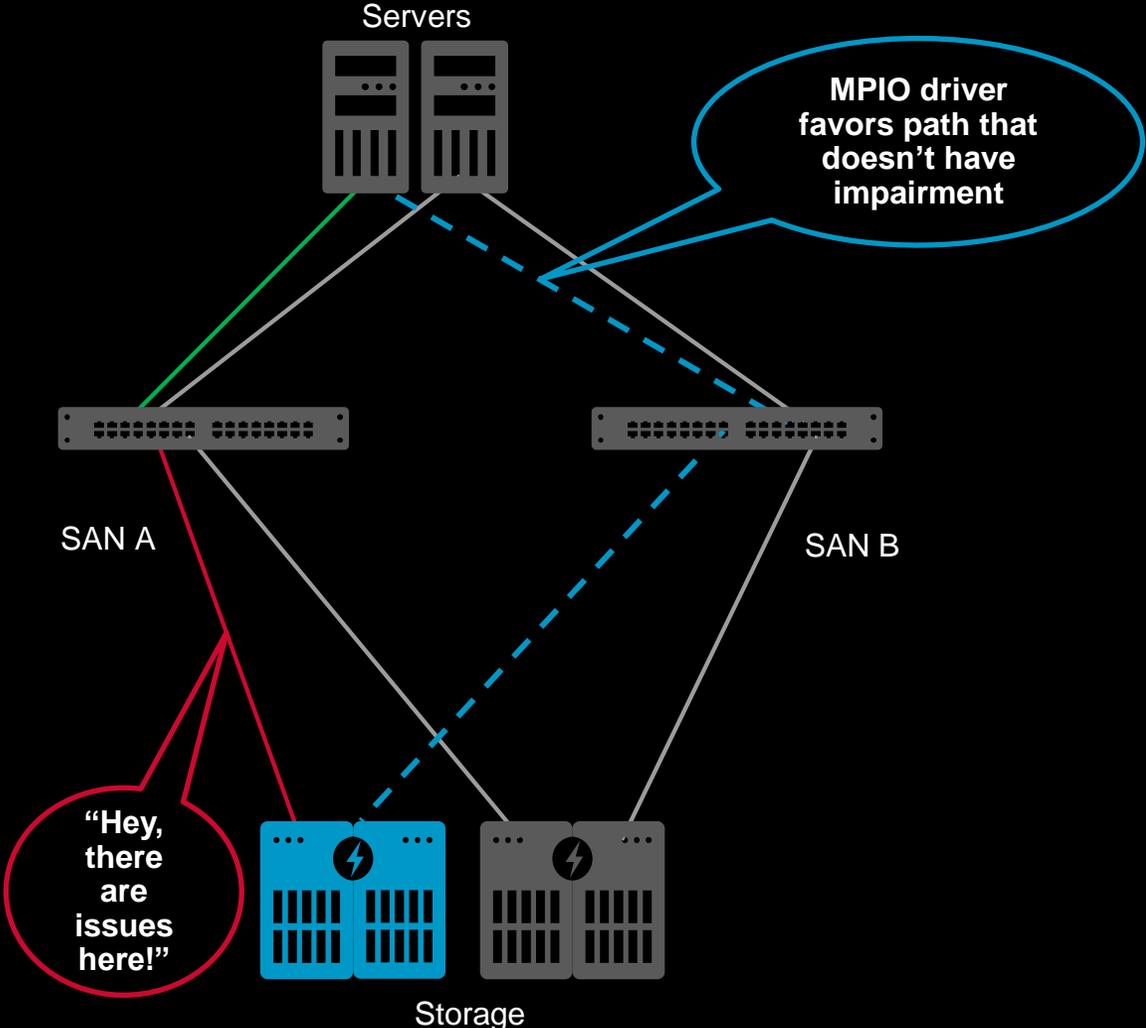
Brocade monitors fabric paths



Brocade sends notifications of impairment



MPIO avoids impaired path



**What are the Gen 7
products from IBM?**

Build a Foundation for the Autonomous SAN with IBM b-type SAN Directors

IBM SAN512B-7 Director

- 14U, eight vertical blade slots
- Scale up to 384 x 64Gb/s ports or 512 x 32Gb/s ports
- 32 additional Gen 7 UltraScale ICL ports

IBM SAN256B-7 Director

- 9U with exhaust shelf, four horizontal blade slots
- Scale up to 192 x 64Gb/s ports or 256 x 32Gb/s ports
- 16 additional Gen 7 UltraScale ICL ports

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Two Director Models

Purpose-built to power large-scale Flash storage, NVMe, and Mainframe environments

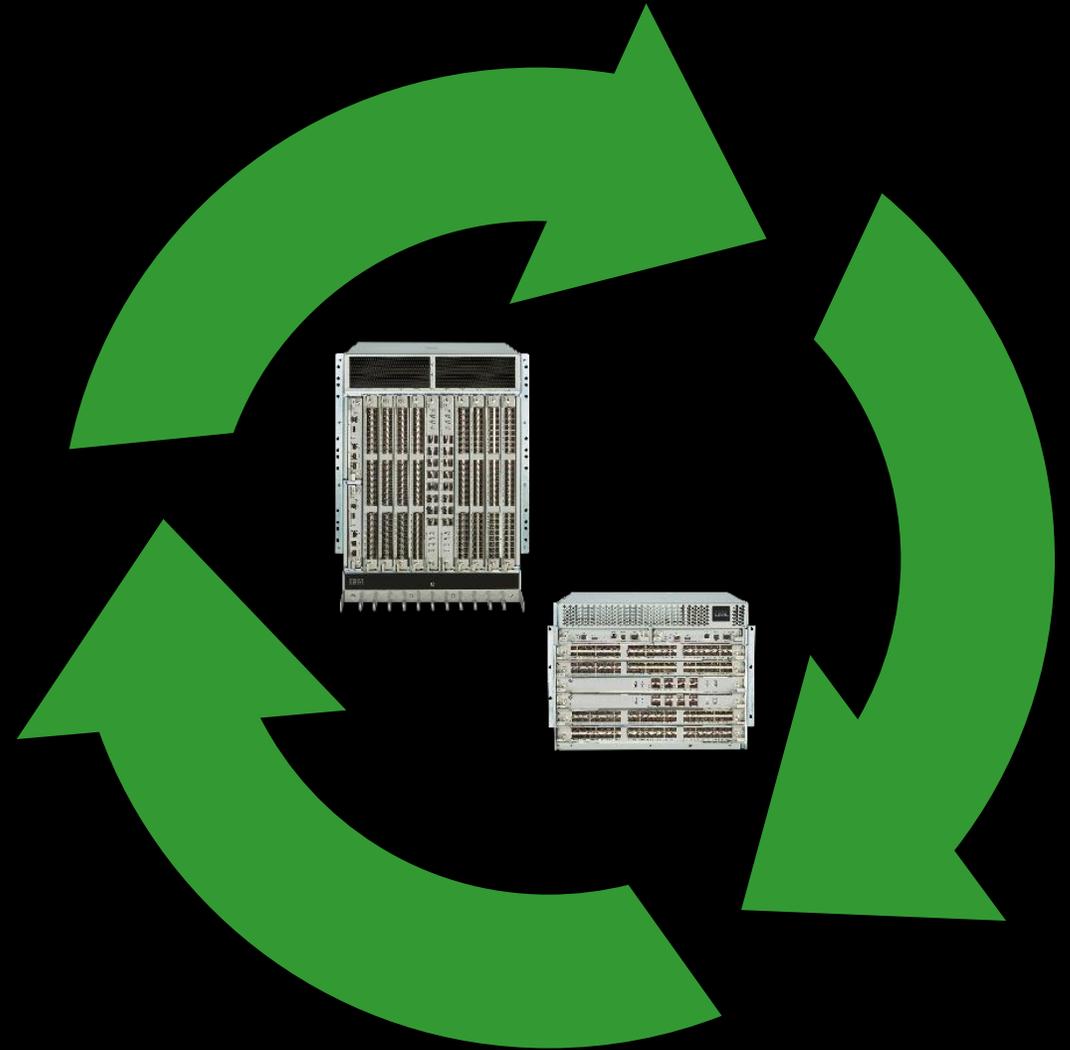
IBM b-type Gen 6 and Gen 7 Director Comparison

		
32Gb/s	 Up to 512 ports (1:1 ratio)	 Up to 512 ports (1:1.33 ratio)
64Gb/s	 Up to 384 ports	 Not Supported
ASIC Latency	 460ns	 780ns
UltraChassis ICL	 Up to 32 Gen7 ICLs	 Up to 32 Gen6 ICLs
Frame-based Load Balancing		
Exchange-based Load Balancing		
QoS Zones Traffic Optimization		
Automated Traffic Optimizer		
Flow Learning	 ~20,000 flows automated	 ~2,000+ flows automated*
IO Insight for SCSI		
IO Insight for NVMe		 64-port blade only
Fabric Perf Impact Notification	 Hardware/Software FPIN	 Software Only FPIN
Gen6/Gen7 Mixed-Blade Support	 Yes	 Yes, w/Gen7 Upgrade Kit

*Requires FOS 9.0+ for auto flow learning

Investment Protection: Upgrade Gen 6 Director to Gen 7

- **Leverage existing chassis and components**
- Upgrade to FOS v9.0+ and FPGA on CP blade
- Upgrade Core Routing blades
- Mix and Match Gen 6 or Gen 7 port blades



The IBM Gen 7 SAN64B-7 Switch

GEN7
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IBM SAN64B-7 Switch

Fixed-port building block, designed to scale-out Flash and NVMe storage environments

- 1U switch for high port density
- Scales from 24 to 56 x 64Gb/s ports
 - 8 port increments on demand
- **All optional software licenses included**
 - Fabric Vision, ISL Trunking, Integrated Routing, FICON CUP, Extended Fabrics
- Simplified deployment, configuration and management of SAN resources with a collection of easy-to-use tools
 - Reduces the number of steps to deploy and configure a switch with EZSwitchSetup
 - Easier to manage with Web Tools simplified user interface

Is your

storage

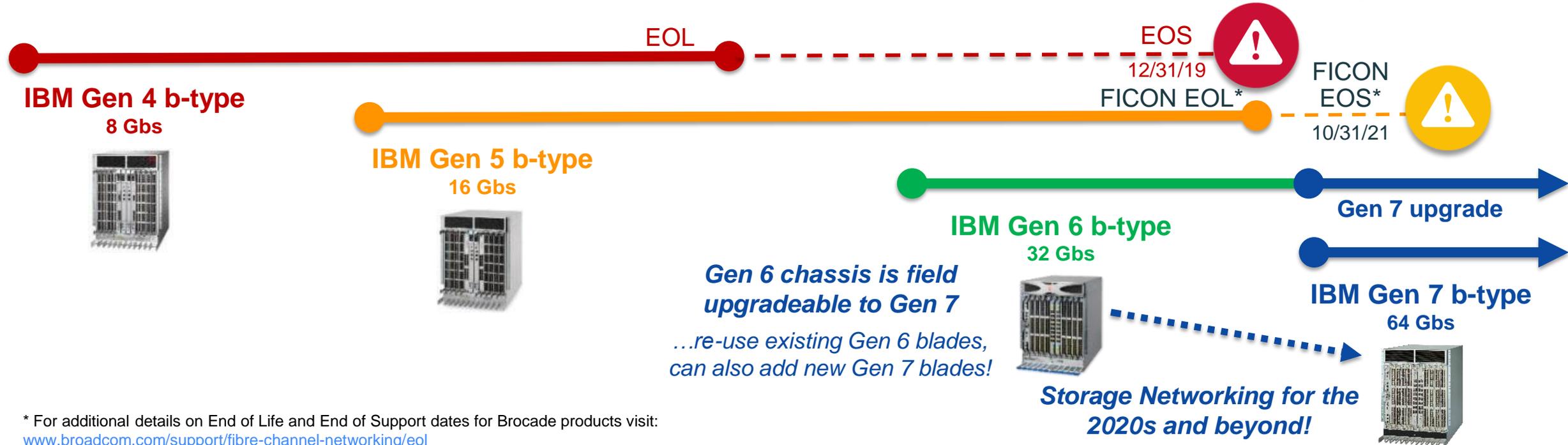
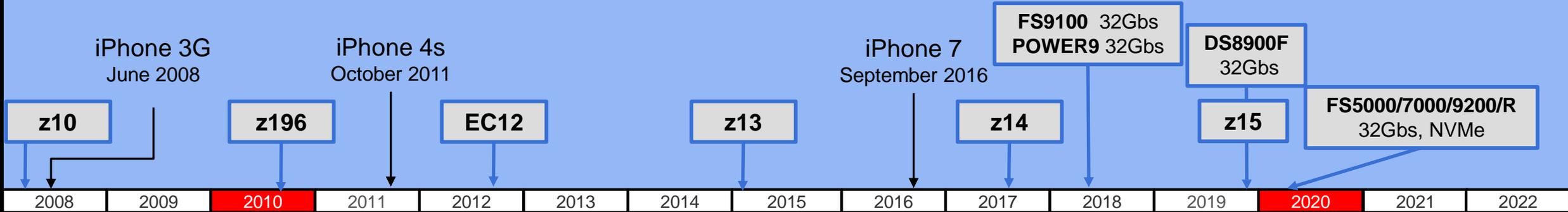
infrastructure

ready for the **next decade?**

It's a New Decade ... and time for Storage and SAN Refresh

Why connect a new **IBM FlashSystem, DS8900F, and POWER9**

to a network that is 8+ years old?



* For additional details on End of Life and End of Support dates for Brocade products visit: www.broadcom.com/support/fibre-channel-networking/eol

Summary

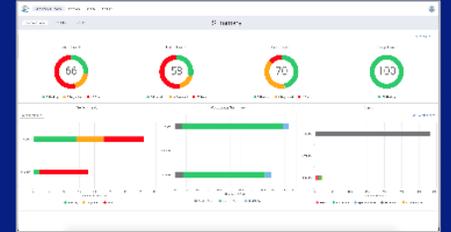
IBM b-type Gen 7 Fibre Channel enables the **Autonomous SAN** which is needed to meet the critical requirements of the **On-Demand Data Center** in 2020 and beyond

IBM b-type

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IBM SANnav



Global View &
Management Portal

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What to do before next week...

Register!

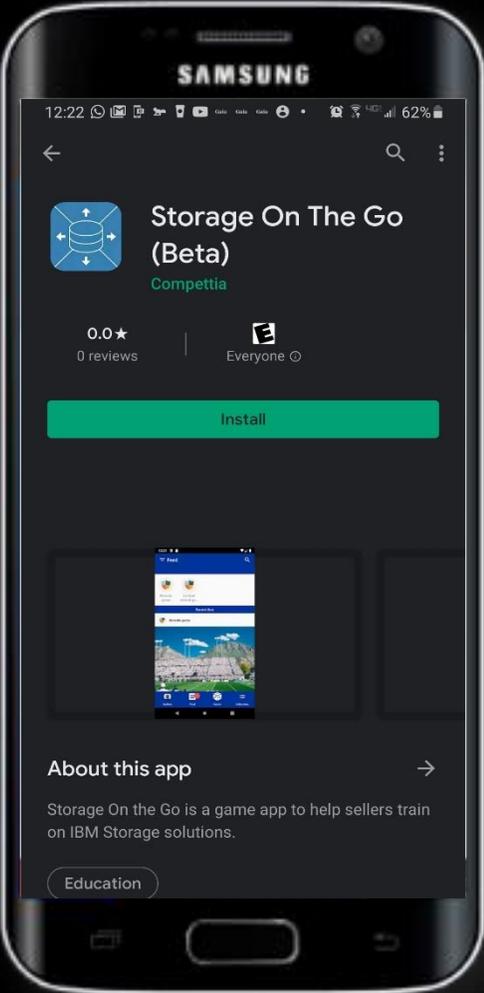
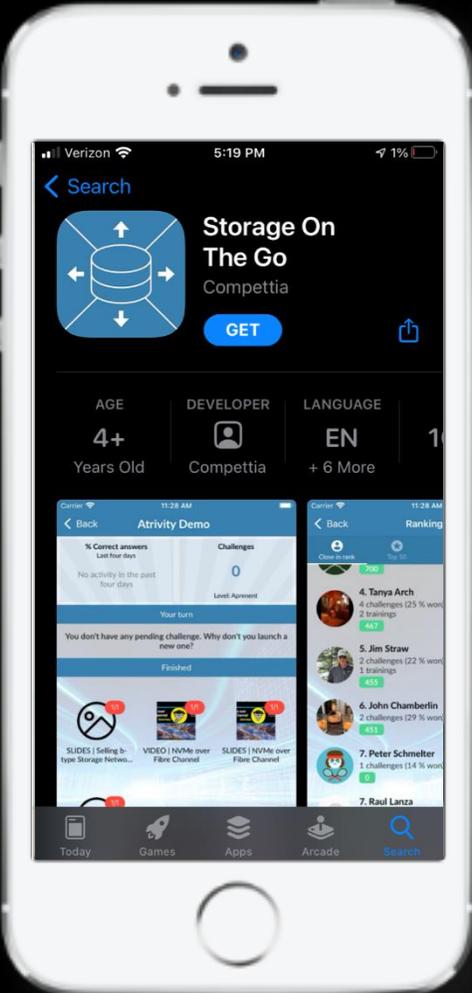
for the

Still Working from Home Webinar Series

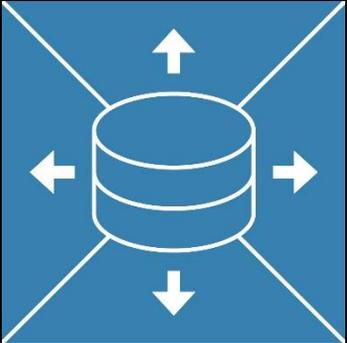
You will receive an email with webinar registration links
and instructions to download and access the

Storage On The Go app

Download app:



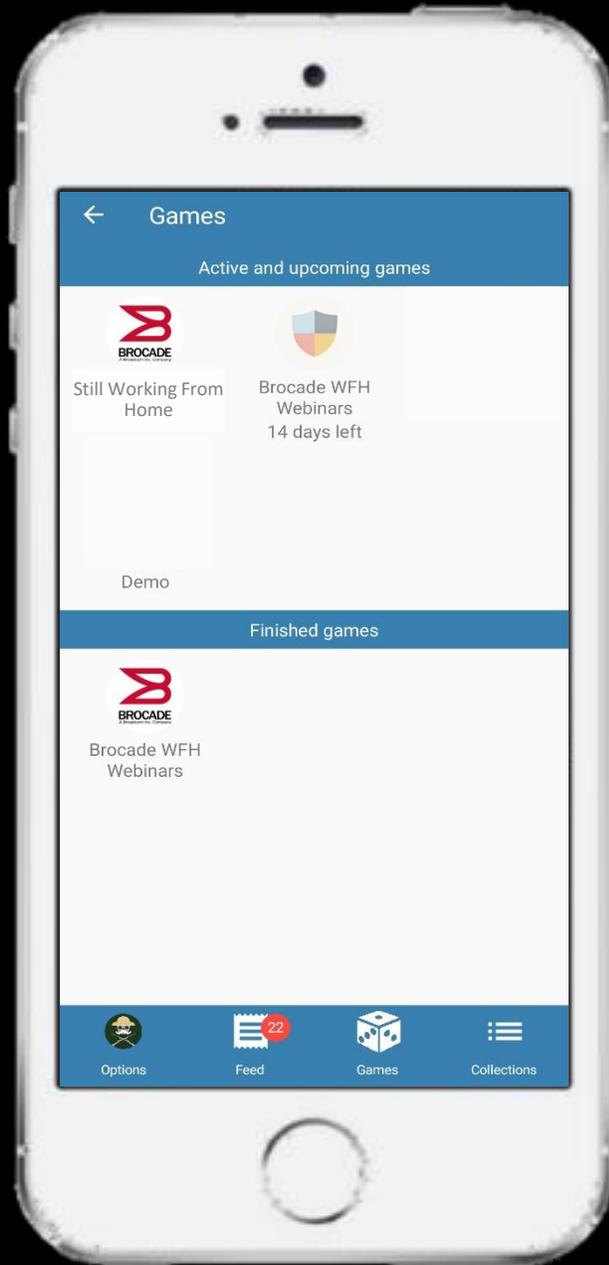
Storage On The Go



Powered by Atrivity

You will receive an email once you are loaded in the app. To login:
User: <registration email address>
Password: **SWFH** (case sensitive)

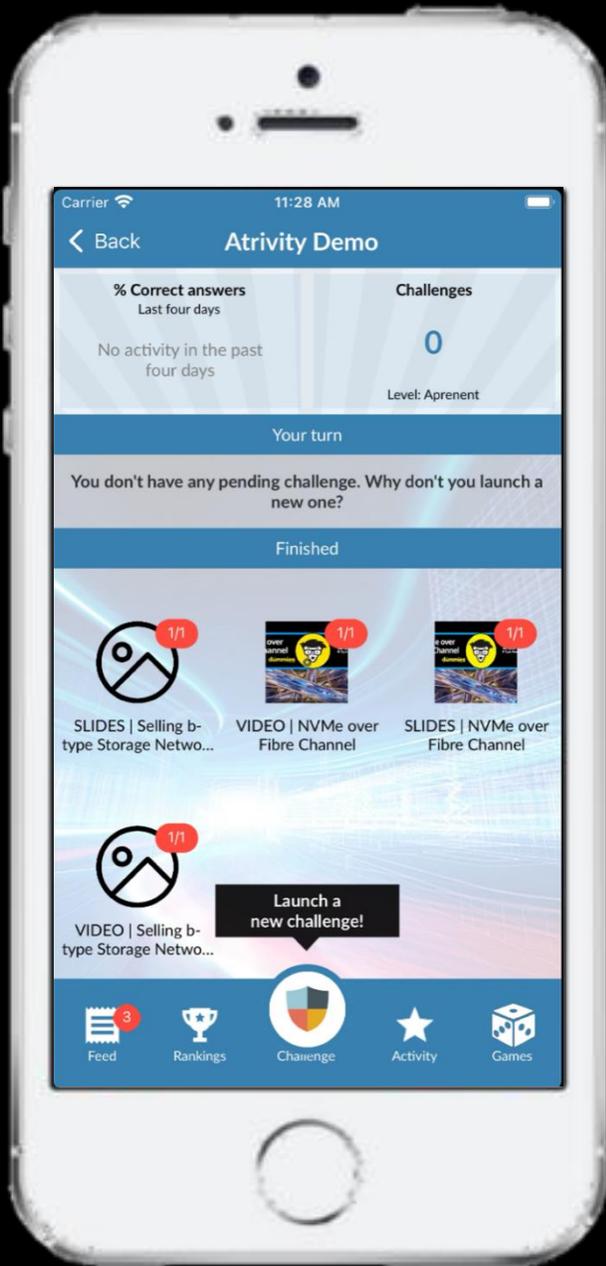
More on the game...



Once you have the Storage on the Go app:

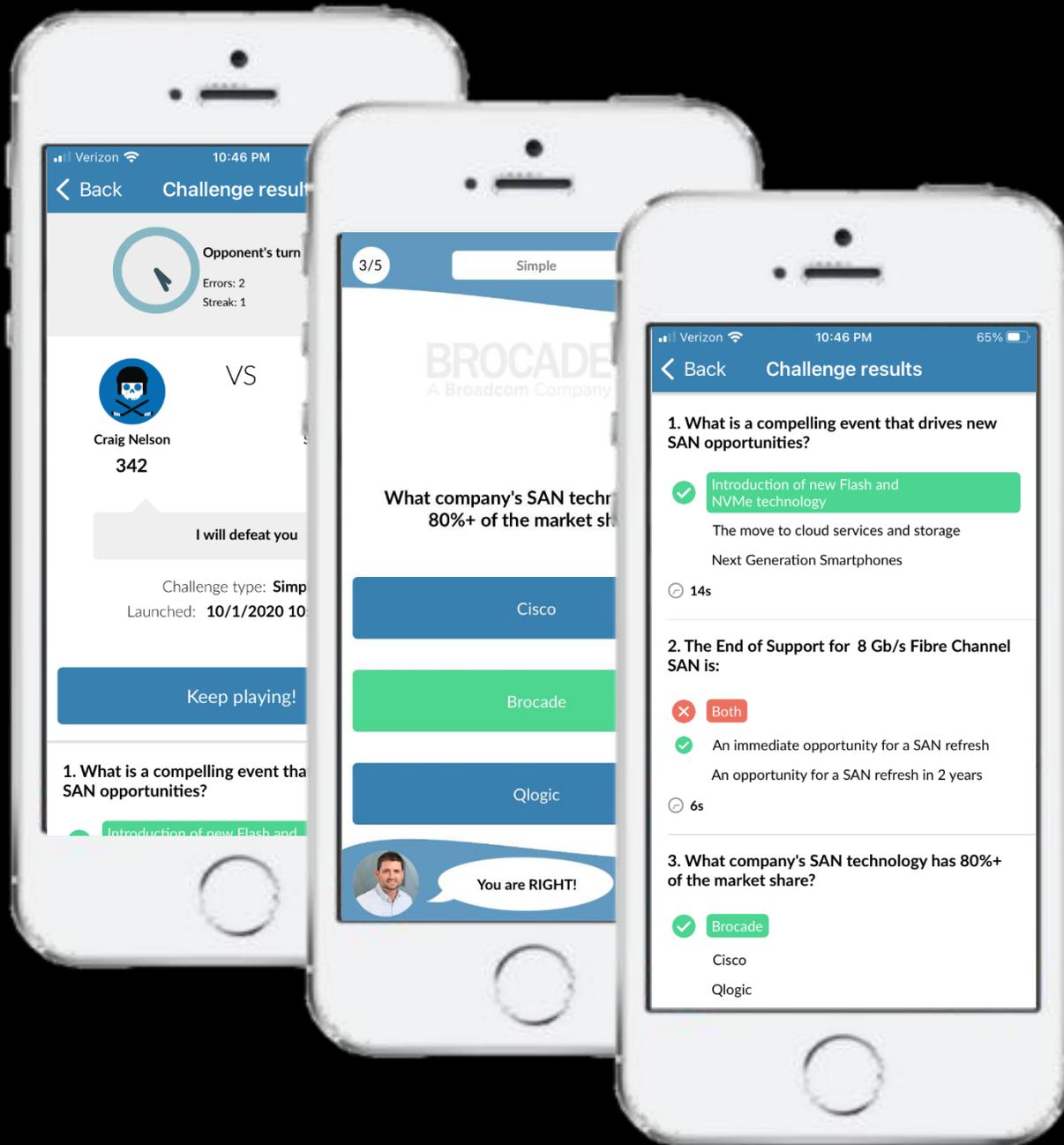
- You will see the active WEBINARS game and the feed, including initial messages with rules rules and instructions
- Tap on “Games” to browse to the **Brocade SWFH Webinar game** (also available via the “Active games” section)

Weekly webinars



- TWO identical webinars every week at times convenient for your geography
- You only need to attend one of the two, they are identical!
- If you miss a webinar, look for links to a recorded version in the app.
- You will receive a total of FOUR challenges each Tuesday and then 2 challenges each on Wednesday, Thursday, and Friday for a total of 10 each week

How to run the challenges



- Tap on a challenge
- Tap on **Run challenge**
- Answer 5 questions
- 20 seconds per question
- Earn points for correct answers and extra points for speed
- *Immediate feedback and points!!*
- Go ahead, play another challenge!
- Less than 2 mins!

How do you win in the
Brocade Challenge Game?

Score Points!!

More challenges completed
=
More points!

IBM Business Partners and Distributors

Learn, Play, WIN!



How do you win in the Brocade Challenge Game?

Score Points!!

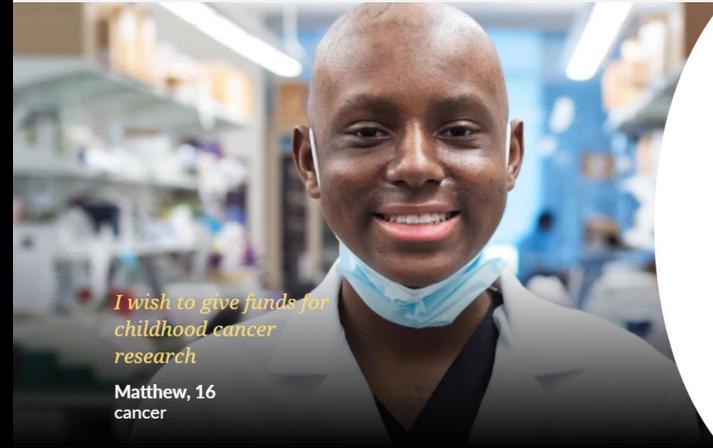
More challenges completed

=

More points!

Direct IBM Employees

Learn, Play, GIVE!



I wish to give funds for childhood cancer research

Matthew, 16
cancer

For a child fighting cancer,
hope is essential.

Help us make every wish come true.

Make-A-Wish



Direct Relief

This session is ending, but....

we're still here for you!



- Product or technology questions
- Storage on the Go app
- Future webinar topics



THE BROCADE STORAGE NETWORKING

STILL
Working from Home
Webinar Series

FOR IBM STORAGE SOLUTIONS

COMING SOON

October 13th

The Autonomous SAN: The Next Gen b-type Storage Networking Portfolio

NEXT UP –

October 20th

What's the Big Deal? The Next Gen b-type SAN Directors and Switch

October 26th – 29th -- Break for IBM TECH-U !!!

Come join us in our SAN sessions, our booth, our via our on-demand technical track

November 3rd

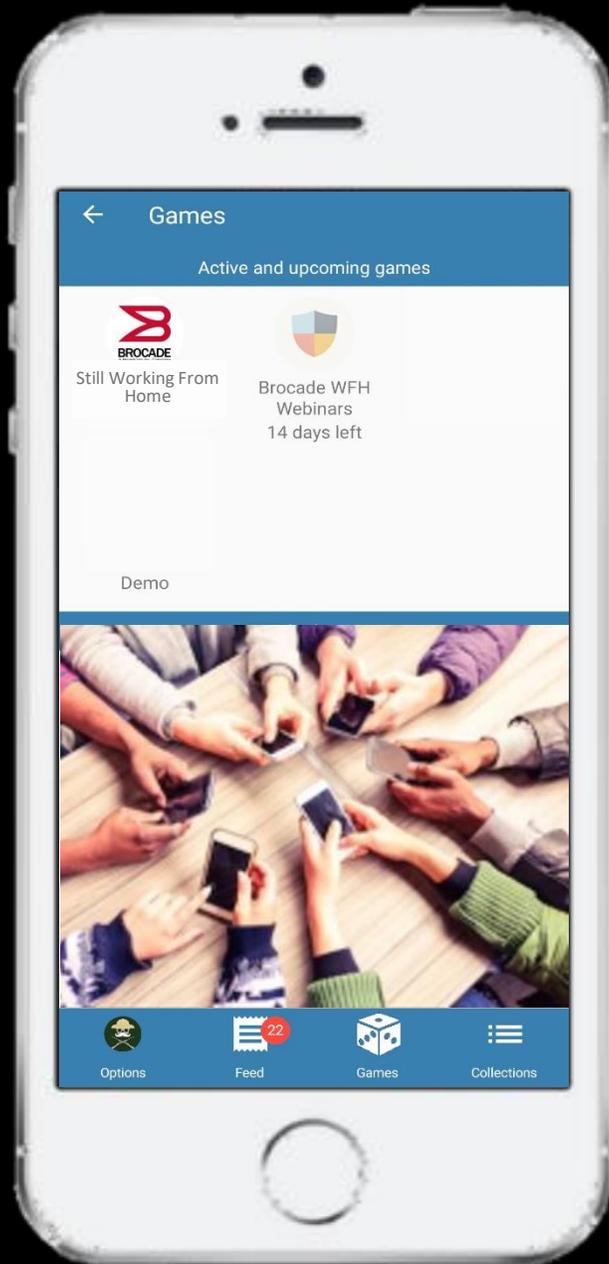
SAN Analytics and the Autonomous SAN: Making Data Center Life Easier

November 10th

Modern SAN Management: How IBM SANnav simplifies setup, management, & troubleshooting

BONUS: November 19th

Architecting for the future with Gen 7 FICON: How to stay a step ahead with your storage infrastructure



STILL
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The Brocade-IBM Working from Home Webinar Series

- Learn
- Earn
- *HAVE FUN!*

Thank You!

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