

The background of the image is a deep purple with a network of glowing, intersecting lines in shades of cyan and magenta, creating a diamond-like pattern. The text is centered in the middle of the frame.

AVEVAWORLD

ACCELERATE INDUSTRIAL INTELLIGENCE

AVEVA WORLD MILAN, MAY 2026

How AVEVA™ PI Data Infrastructure has accelerated analytics insights

Performance, resiliency, and scale improvements across the AVEVA™ PI System™ portfolio

Brian Young, R&D Director – Head of PI System Architecture, AVEVA

AVEVA

AVEVA WORLD MILAN, MAY 2026

Agenda

How AVEVA PI Data
Infrastructure has accelerated
analytics insights

Why this matters now

Where customers feel friction

What changed

What the results look like

What it means in practice

What's next

Brian Young

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Why this matters now

Why this matters now

Industrial analytics are asking more from data infrastructure



More analytics across more assets and templates



More demand for responsive PI Vision™, APIs, and clients



More recalculation, replay, and backfill



Less tolerance for disruption and slow recovery



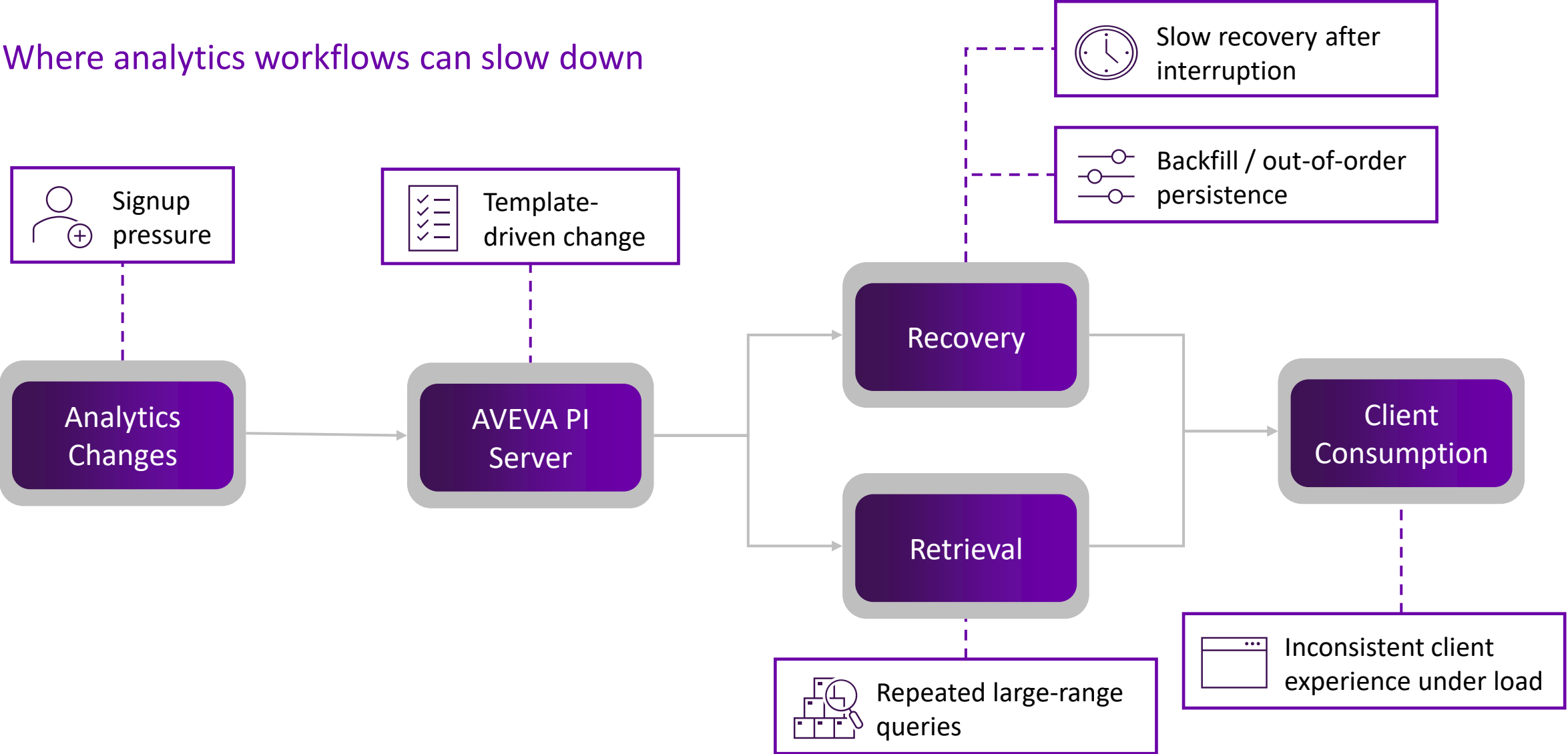
Higher expectations under mixed load



More AI and data science consumers using PI System data

Where customers feel friction

Where analytics workflows can slow down



What changed in AVEVA PI Data Infrastructure



**The best systems are
predictable when several things
are happening at once**

Changes across path to insight

Improvements starting with PI Data Archive



PI Data Archive concurrency



Recovery



Repeated retrieval



Out-of-order events



Client-side efficiency

Analytics-heavy workloads create less disruption than before

Better concurrency under analytics load



Better concurrent signups and updates



Less interference with other clients



More activity without disruption

~2.5x

more concurrent applications
without disruption

30s

interruption no longer seen
when disabling 2,000 analyses

Faster recovery after change

Recovery is faster after outages and large analytics changes



More robust after PI Data Archive disruption



Recovery without manual restart in larger systems



Faster enable/disable recovery

300,000 analyses / 25%

~1 hour → <15 minutes

Faster recovery after change

Recovery is faster after outages and large analytics changes



More robust after PI Data Archive disruption



Recovery without manual restart in larger systems



Faster enable/disable recovery

400,000 analyses / 25%

~30 minutes

Faster recovery after change

Recovery is faster after outages and large analytics changes



More robust after PI Data Archive disruption



Recovery without manual restart in larger systems



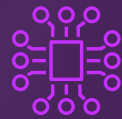
Faster enable/disable recovery



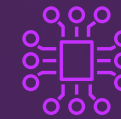
120,000+
analyses recover within
minutes after PI Data Archive
restart



Template-driven analytics changes at scale



More manageable



- One template change can **ripple out widely**
 - Historically disruptive to PI Data Archive, clients, and recovery
- **Major bottleneck resolved** in PI Server 2024
- Gains broadly align with large enable/disable recovery
 - Analysis Service restart may still help in some large cases

Repeated and overlapping queries are faster

Queries benefit from a more efficient read path

- Better cache sizing and retrieval efficiency
- Strongest with overlapping/reused time ranges
- Repeated summaries and iterative historical access

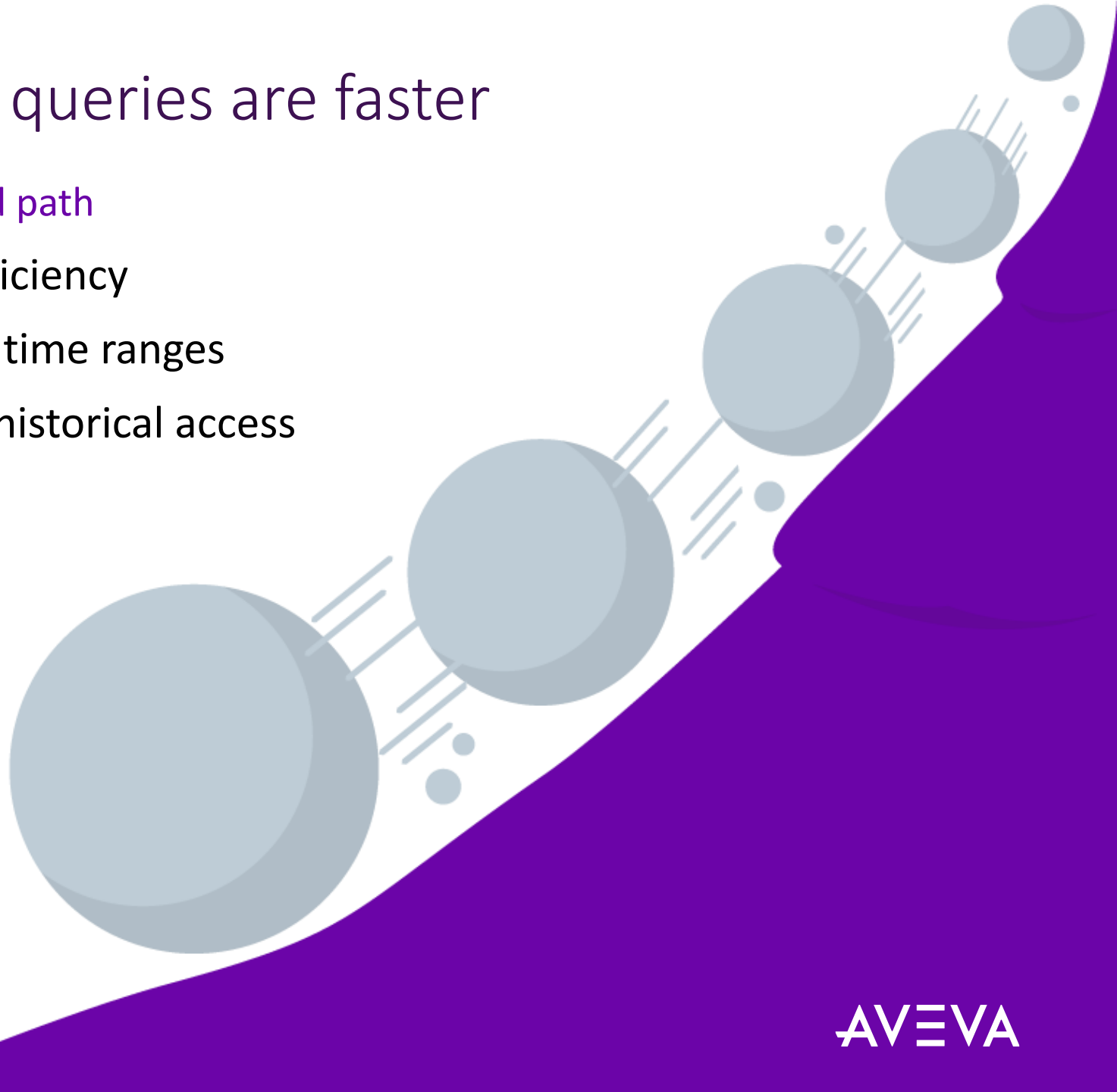
~40%

faster cached retrieval
default sizing measured
server-side scenarios

Up to

6x faster

for 3M+ event queries
with appropriately sized cache



Backfill and out-of-order processing improved

Backfill-heavy workflows complete more efficiently

100,000 string events
↓
10x faster

15 days of backfill
↓
2x faster



Better out-of-order persistence



Fewer bottlenecks in sustained/high-volume backfill



Replay, recalculation, and reprocessing scenarios

Client-side retrieval improvements

Applications consuming PI data also became more efficient

- PI AF Client 2024 R2 retrieval optimizations
- PI Vision, Datalink, API/SDKs, AI workloads
- Especially useful in recovery / queue catch-up

**More
usable headroom
on same hardware**

**CPU
Usage
(before)**

20%
lower CPU
Archive event
retrieval
scenarios

~25%
lower CPU
Multi-event /
direct client
retrieval

45-55%
lower CPU
Data pipe
retrieval
scenarios

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What this means in practice

What this can mean in practice

For PI Analytics users



Faster recovery after interruption



Less disruption from broad changes



Better recalculation with backfill

What this can mean in practice

For client applications and users



Smoother under mixed load



Faster repeated retrieval



PI Vision, Datalink, API/SDKs





What this can mean in practice

For administrators and architects



More robust recovery at scale



Fewer unnecessary service restarts



More usable capacity on existing infrastructure

What this can mean in practice

For AI and data-driven workloads



More consistent access to PI
System data under mixed load

Less cross-workload
disruption



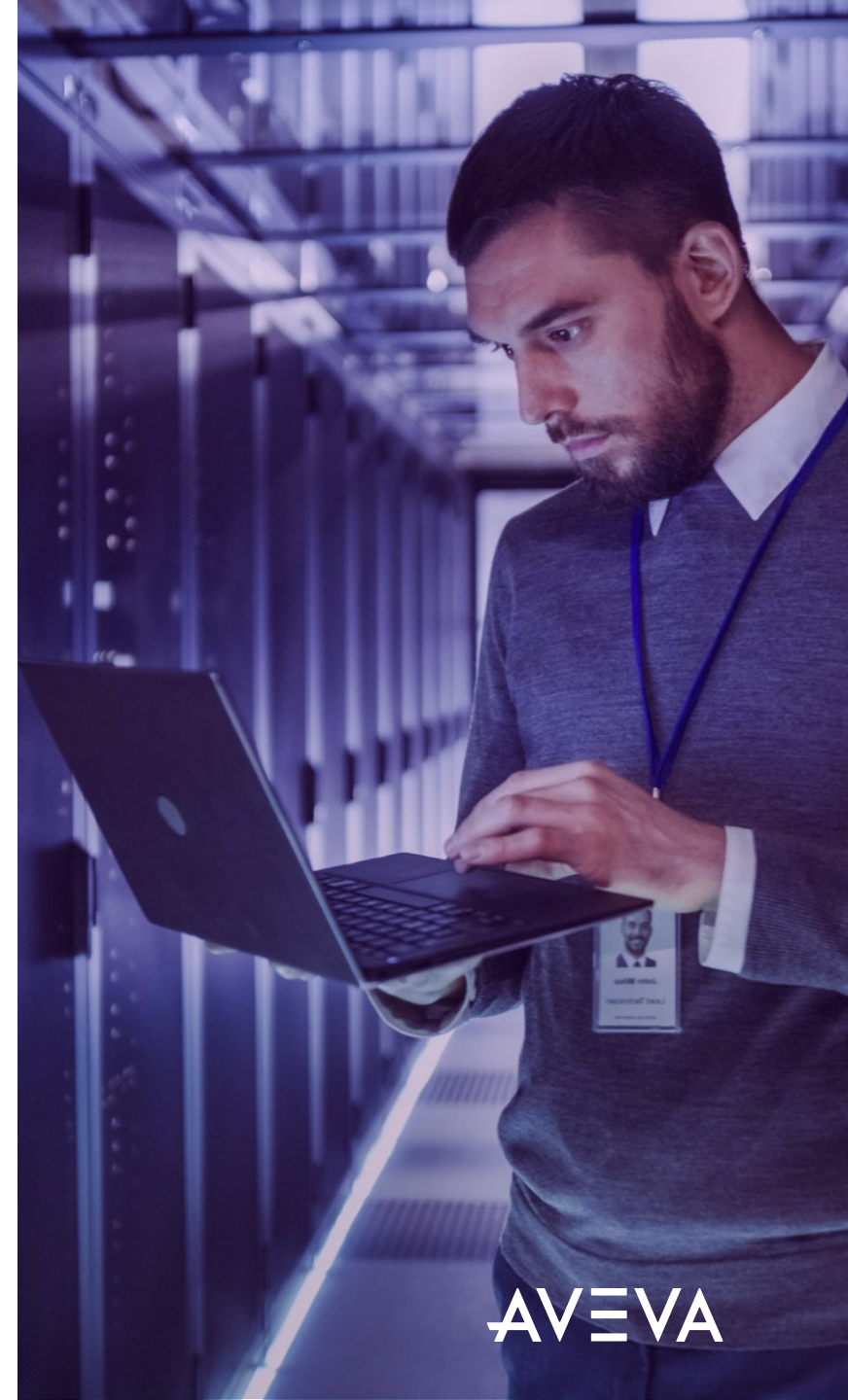
Better support for repeated
historical retrieval

Better iterative access
patterns



A stronger foundation for
future AI-enabled applications

More headroom for newer
consumers





Practical scenarios to evaluate

Where to evaluate impact in your own environment

Large or rapidly growing analytics deployments

Frequent template-based analysis changes

Recovery after short outages or network interruptions

Repeated summary or overlapping-range queries

Practical scenarios to evaluate

Where to evaluate impact in your own environment

Heavy recalculation or backfill periods

PI Vision or similar client workloads under mixed load

AI or data science workflows with repeated PI data retrieval

See **Performance improvements in AVEVA PI Server 2024** for scenario examples, limitations, and workload guidance.

Looking ahead

What's next

Scaling Asset Analytics further



Growing workloads increase the need for scale and isolation



(Developing) Scaling PI Asset Analytics across multiple service instances



**Greater
Capacity**



**Better
workload
distribution**



**Isolation of
critical
analyses**



**Improved
resilience
options**

What improved

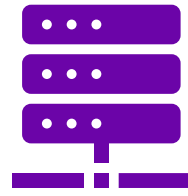
Selected results from measured scenarios



Concurrency

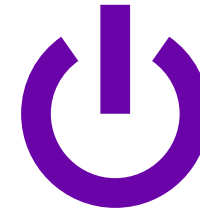
~2.5x more concurrent applications without disruption

No 30-second interruption from disabling **2,000 analyses**



Restart Recovery

120,000+ analyses recover within minutes after PI Data Archive restart



Enable-Disable Recovery

300,000 analyses / 25%: ~1 hour to <15 minutes

400,000 analyses / 25%: ~30 minutes

Results shown are from measured internal test scenarios using published topology 3. Actual results will vary by hardware, topology, ingress/egress patterns, and workload characteristics.

What improved

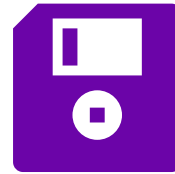
Selected results from measured scenarios



Retrieval

~40% faster cached retrieval

Up to **6x faster** for **3M+** event scenarios



Backfill

15 days of backfill → 2x faster

100,000 string events → 10x faster



Client-side efficiency

20% lower CPU for archive event retrieval

25% lower CPU for multi-event / direct client retrieval

45–55% lower CPU for data pipe retrieval

Results shown are from measured internal test scenarios using published topology 3. Actual results will vary by hardware, topology, ingress/egress patterns, and workload characteristics.



A STRONGER OPERATIONS DATA FOUNDATION

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Questions?



Please wait for the microphone.
State your name and company.

Please remember to...

Navigate to this session in the
mobile app to complete the survey.

Thank you!

Sessions of Interest – Day 3, May 21st

Standards for asset modeling with AVEVA™ PI Data Infrastructure

Asset model library for PI Data Infrastructure

@ 9:00 am

Spotlight Theatre - Level 0

User-friendly AVEVA Adapter configuration

AVEVA Adapters

@ 9:30 am

Spotlight Theatre - Level 0

Accessing your AVEVA PI Server through OPC UA

AVEVA PI OPC UA Server

@ 10:30 am

Brown 3 - Level 2

Supporting expanding needs with AVEVA™ PI Vision™ 2025

PI Vision deep-dive

@ 11:15 am

Brown 3 - Level 2

BREAKOUTS & ROUNDTABLES

Centralized audit trail management for AVEVA PI Data Infrastructure

AVEVA Discussion Group

@10:15am

Amber 5 - Level 2 - "The Hub"

Roundtable (Hive & Hub)

Visit Us!

Stop by these booths in the innovation zone for demos and additional information:

Transform real-time data into actionable information with AVEVA PI Server

AVEVA PI Data Infrastructure

AVEVA PI Server

Visualize your operations data with AVEVA PI Vision

AVEVA PI Data Infrastructure

AVEVA PI Vision

OT + IT data connectivity, securely between on-premises and cloud systems

Connectivity

Enterprise data integration

Databricks, Snowflake



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Over 20,000 enterprises in over 100 countries rely on AVEVA to help them deliver life's essentials: safe and reliable energy, food, medicines, infrastructure and more. By connecting people with trusted information and AI-enriched insights, AVEVA enables teams to engineer efficiently and optimize operations, driving growth and sustainability.

Named as one of the world's most innovative companies, AVEVA supports customers with open solutions and the expertise of more than 6,400 employees, 5,000 partners and 5,700 certified developers. The company is headquartered in Cambridge, UK.

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