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WHERE PI GEEKS MEET

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Unleash the Power of Future Data in the PI System

CAN YOU EXCEED 1.21 GIGAWATTS?

Presented by

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Omar Shafie, *Development Lead*

Satyam Godasi, *Development Lead*

Interactive Polling

- Please pull out your mobile device or laptop computer

Choose One

- Web: pollev.com/delorean
- SMS: text CODE to 22333
- Twitter: tweet "@poll CODE"

START YOUR ENGINE

How far into the future can *released* versions of the PI Data Archive accept new values?

1. 2 seconds
2. 10 minutes
3. Up until January 2038
4. Oh, you mean there's a limit?
5. It depends

START YOUR ENGINE

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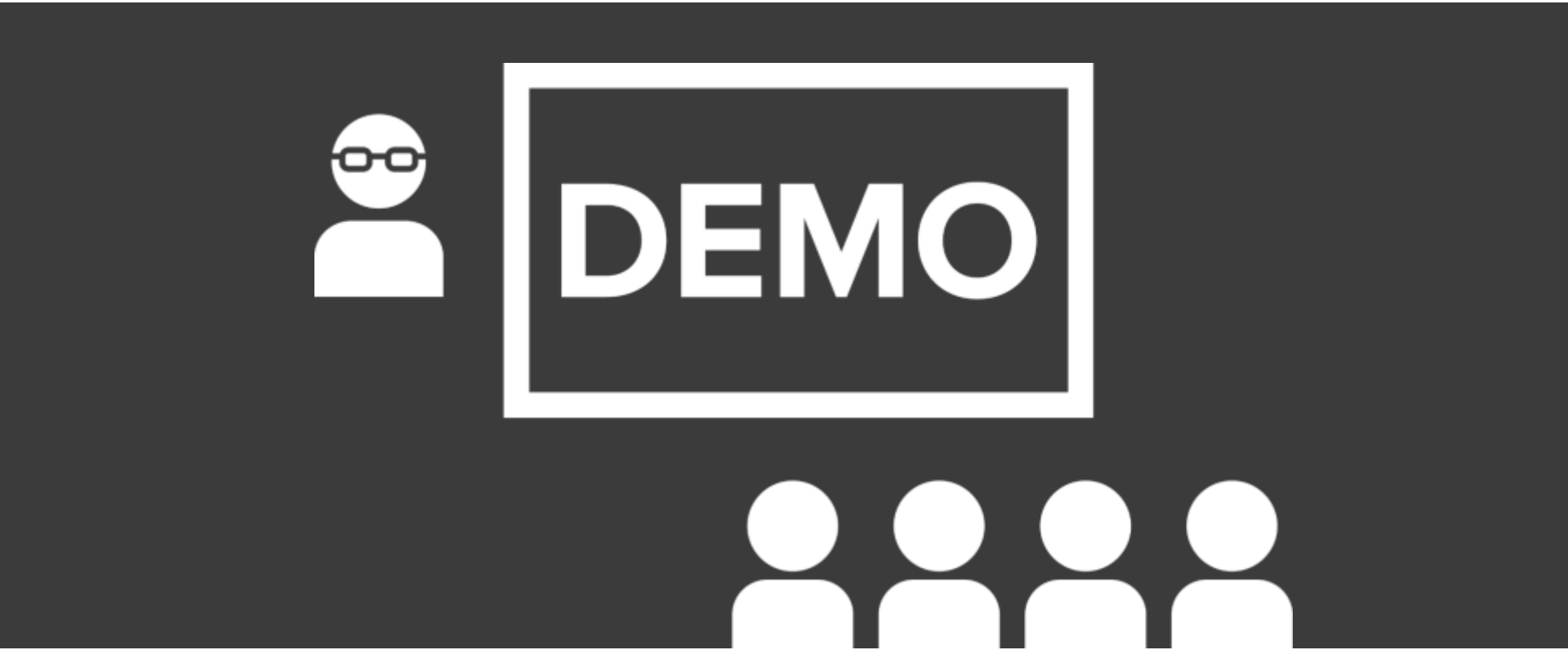


Future Data Use Cases

1. Forecasting
   - ❖ Market, demand, production capacity, weather, etc.
2. Equipment Management
   - ❖ Predicted availability, maintenance, performance
3. Production Scheduling
   - ❖ Execution plans based on forecast and capacity
4. Research and Lab Activities
   - ❖ What-if scenarios, simulation training, lab experiments

Working Assumptions

1. Most common time horizon: Hours to Days
   - Practical limit: Jan 2038 (max UTC32 range)
2. Future data comes from outside PI
   - Imported with PI Interfaces and/or generated by custom apps
3. Lower density, more revisions
   - Frequent add, delete, edit bursts
4. Different lifecycle than historical data
   - Specific storage and data retention requirements

One Rule Shall Remain…

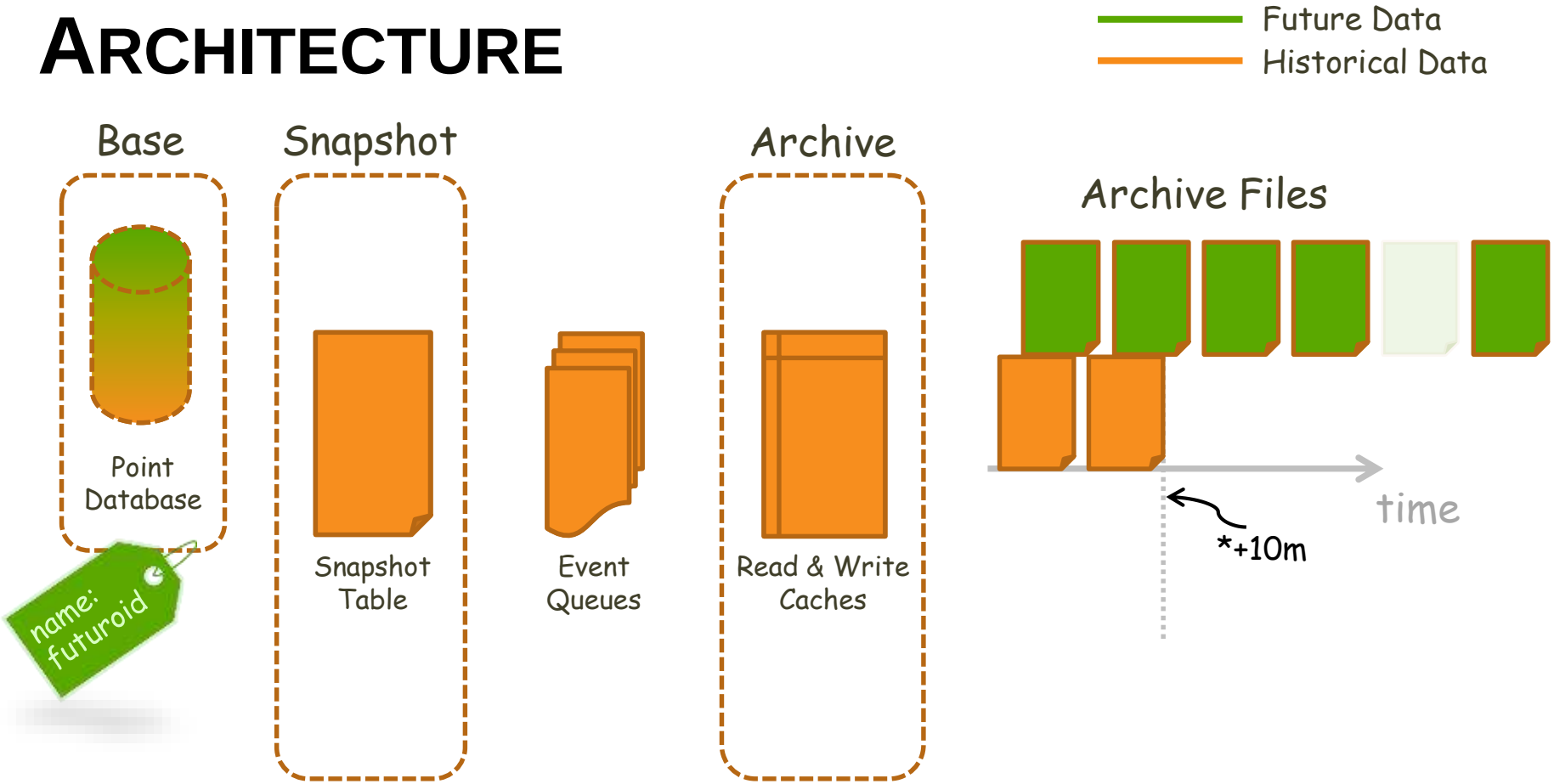
'*' == Now

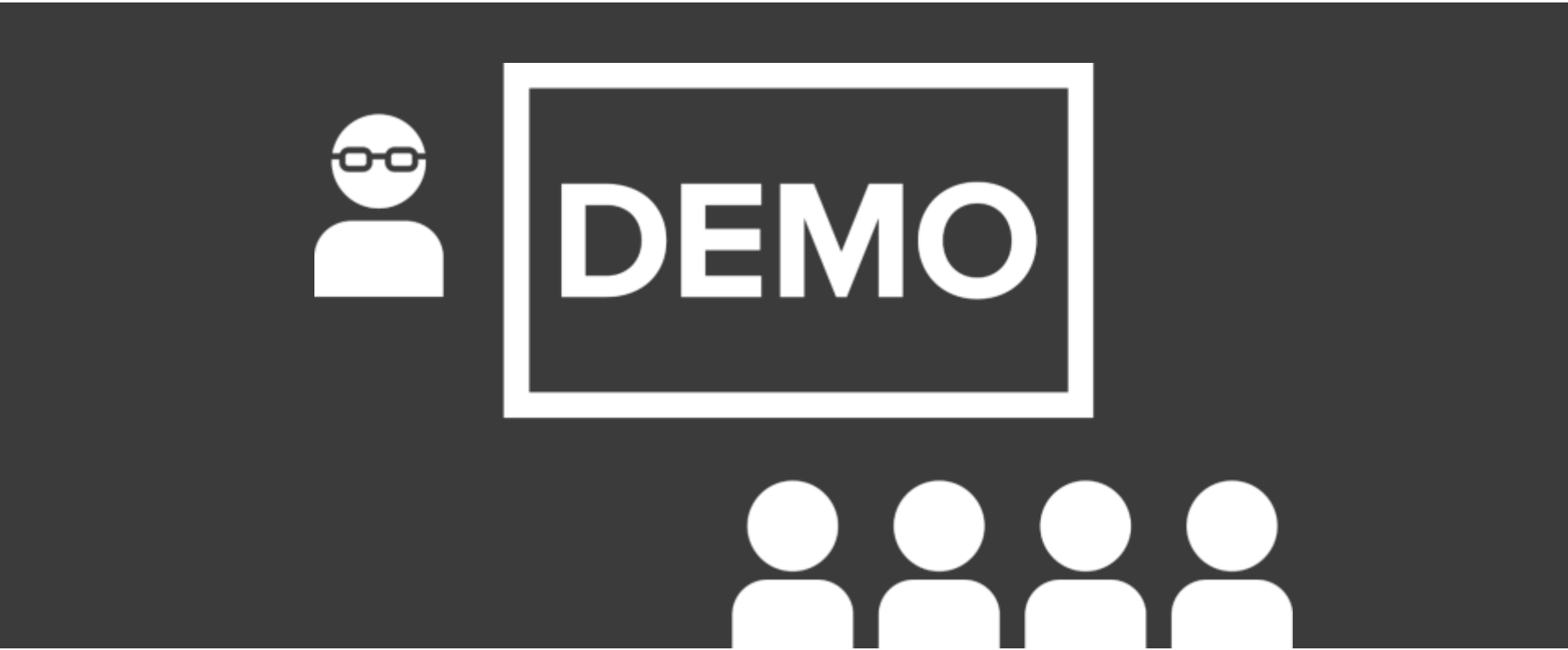
(from the client's perspective)

PI Data Archive "DeLorean"

1. Clear and Flexible Data Management
   - Simple choice, independent streams, different data lifecycles
2. High Reliability & Performance
   - On par with PI Server 2012, no impact on historical data
3. Familiar Administration Experience
   - Consistent maintenance, troubleshooting, and repair tools
4. Practical and Strategic Approach
   - Leverage PI Server 2012, design for subsequent versions

ARCHITECTURE





PI Data Archive "DeLorean"

1. Self Driving
   - Automatic, on-demand, archive management
2. Fast & Scalable
   - Unlimited historical and future data storage
3. Expert Friendly
   - Powerful yet familiar administration tools
4. Forward Looking
   - Leveraging and expanding PI Server 2012

Interactive Polling

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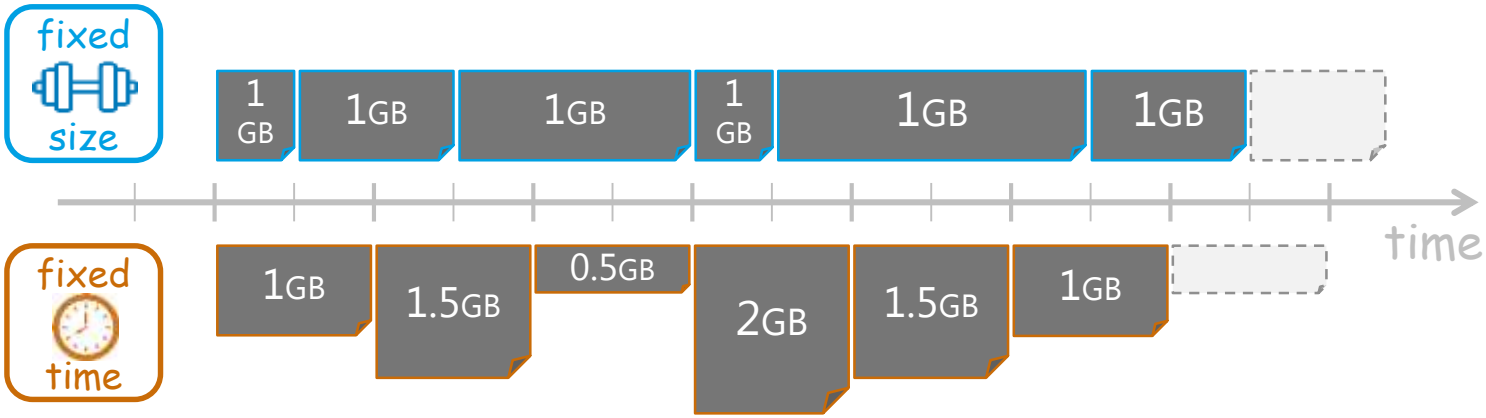
Future Archive Files

What should the default management criteria be for future data archives?



Future Archive Files

What should the default management criteria be for future data archives?

1. Fixed size
2. Fixed size, with a min/max time
3. Fixed time
4. Fixed time, with a min/max size
5. I have another idea

FUTURE ARCHIVE FILES

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Point Creation Choice

At creation time, do you know if points will receive future data?

MyPoint.future = 0
MyPoint.future = 1

Point Creation Choice

At creation time, do you know if new points will receive future data?

1. Yes, always
2. Usually
3. Almost never
4. Why should I care?

POINT CREATION CHOICE

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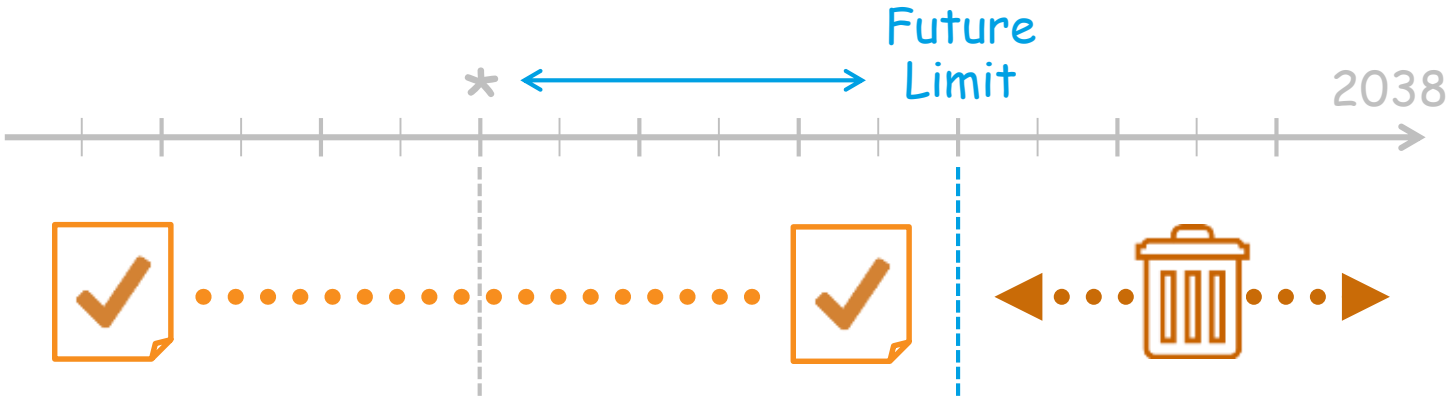
Write Enforcement

Should we provide an option to reject future data before January 2038?



Write Enforcement

Should we provide an option to reject future data before January 2038?

1. Absolutely not
2. Maybe, but leave it off by default
3. Yes, with a short default (e.g., 1 week)
4. Yes, with a long default (e.g., 1 year)
5. I have another idea

WRITE ENFORCEMENT

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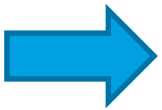
COMPRESSION + INTERPOLATION

What should be the *default configuration* of future data PI Points?



COMPRESSION + INTERPOLATION

What should be the default configuration of future data PI Points?

1. Staircase, no compression
2. Same as historical tags
3. Something else

COMPRESSION + INTERPOLATION

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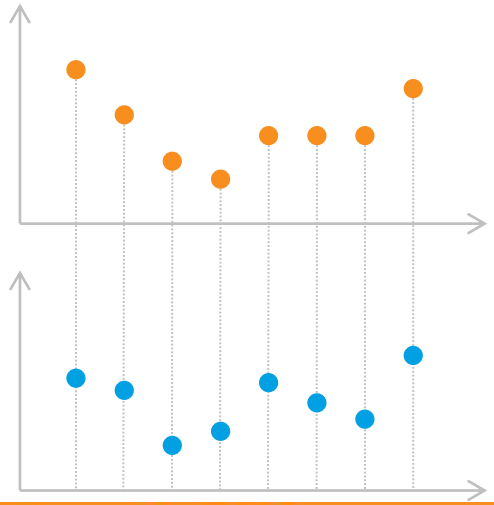
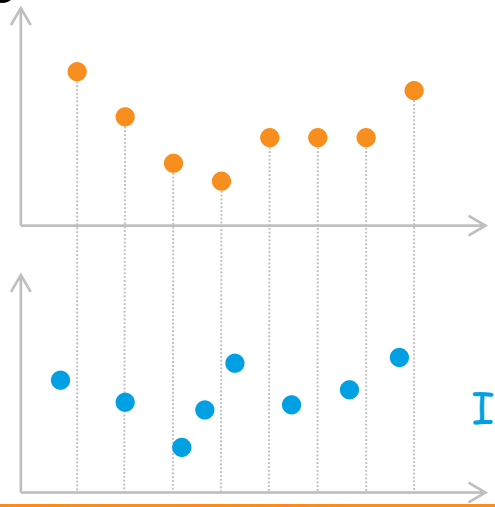
REWRITING THE FUTURE

When updating future data, especially forecasts, what SDK call(s) would you use?



Replace Existing Values



Remove Existing, Insert New

Rewriting the Future

When updating future data, especially forecasts, what SDK call(s) would you use?

1. Replace only (aligned timestamps)
2. Get + Remove + Insert
3. #2, with new “Clear Time Range” command
4. I have another idea

REWRITING THE FUTURE

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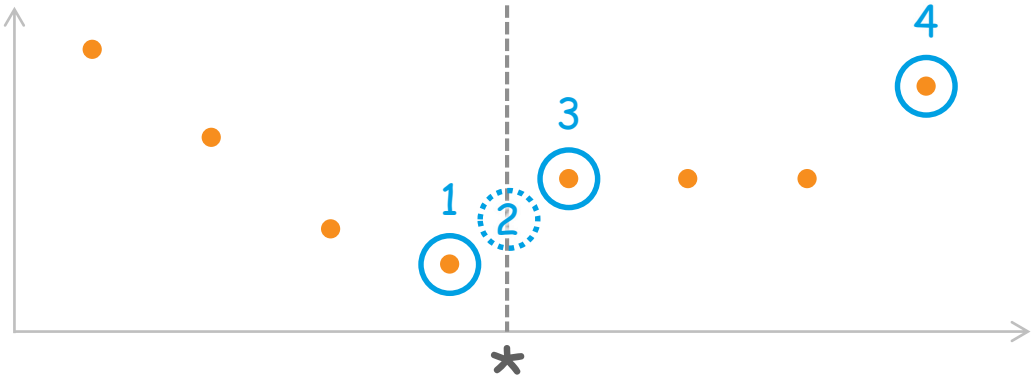
SINGLE VALUE

What should be returned when asking for the "snapshot" value of a future tag?



SINGLE VALUE

What should be returned when asking for the "snapshot" value of a future tag?

1. Recorded value before "now"
2. Interpolated "now"
3. Recorded value after "now"
4. Same as historical tags (end of stream)
5. It depends

SINGLE VALUE

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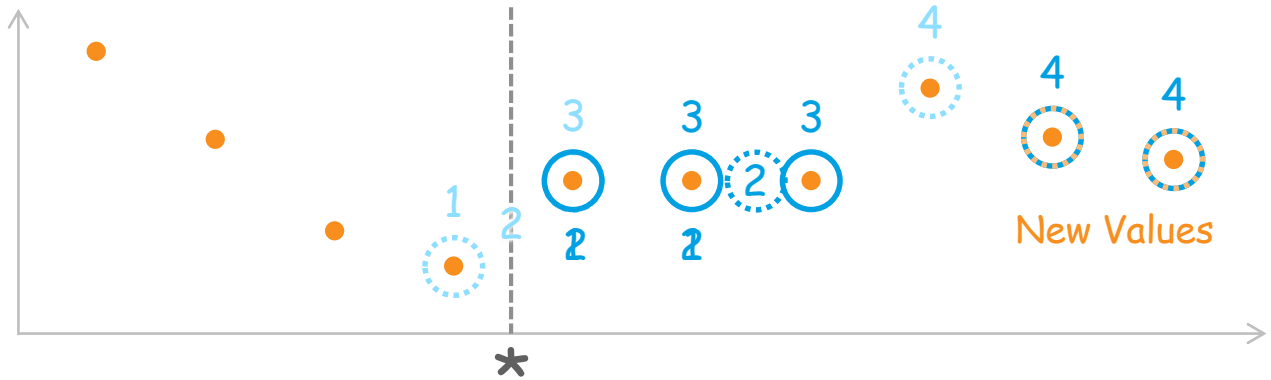
SINGLE VALUE, UPDATING

When signed up for “snapshot” updates, here are the values you would get:



SINGLE VALUE, UPDATING

Knowing the update behavior, do you maintain your choice of "snapshot" value?

1. Recorded value before "now"
2. Interpolated "now"
3. Recorded value after "now"
4. Same as historical tags (end of stream)
5. It still depends

SINGLE VALUE, UPDATING

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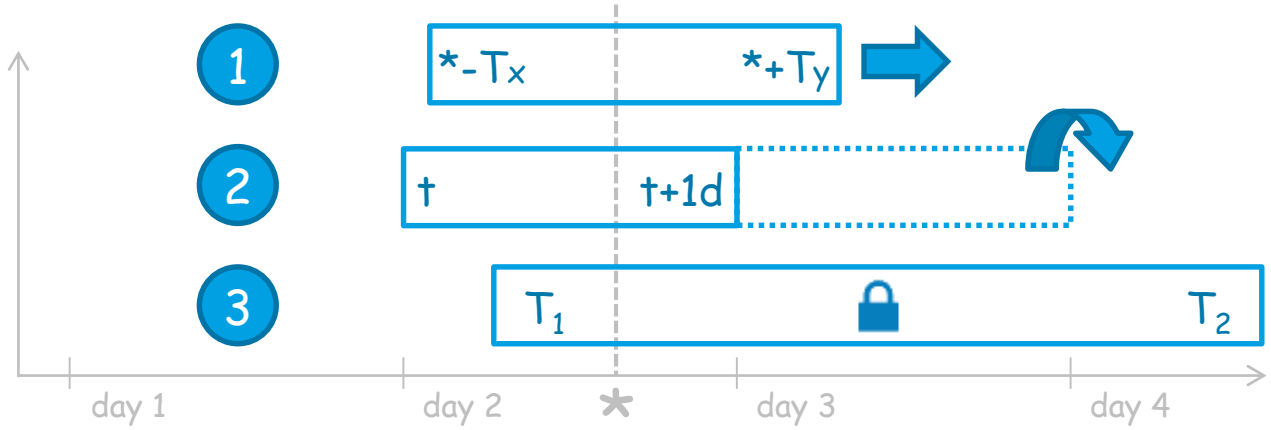
TIME RANGE

When querying both future and historical data, what would be the typical time range?



TIME RANGE

When querying both future and historical data, what would be the typical time range?

1. Sliding window (relative times)
2. Jumping window (e.g., day, shift)
3. Fixed window (absolute times)
4. Something else

TIME RANGE

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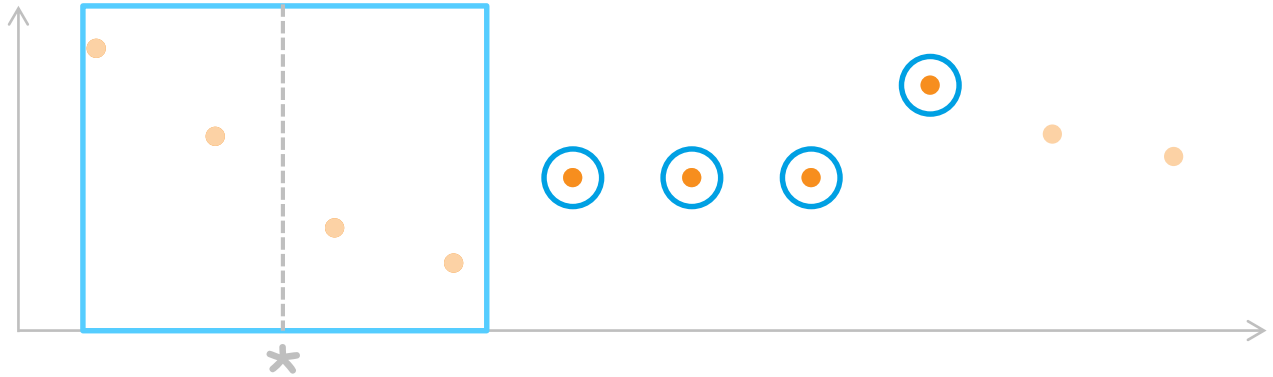
Time Range, Updating

As existing future data enters the time window, how should it be refreshed?



Time Range, Updating

As existing future data enters the time window, how should it be refreshed?

1. By custom application code
2. Automatically, via enhanced PI System functionality
3. Manually, by the end user
4. I have a better idea

TIME RANGE, UPDATING

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Future Relationships

How will you associate historical tags with corresponding future tags?

MyPoint.tagname = *.FC
MyPoint.sourcetag = *.PV
…

MyAsset.value_forecast
MyAsset.value_actual
…

Future Relationships

How will you associate historical tags with corresponding future tags?

1. Tag naming convention
2. Other point attributes
3. Existing AF data references
4. AF data references, but with new associations
5. I have another idea

FUTURE RELATIONSHIPS

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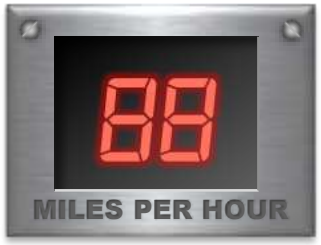
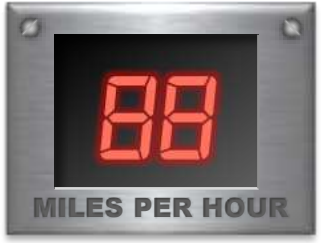


PARALLEL UNIVERSE

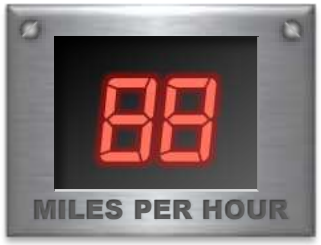
If absolutely necessary, how would you store and manage multiple (N) forecast versions?



PARALLEL UNIVERSE

If absolutely necessary, how would you store and manage multiple (N) forecast versions?

1. Rotate among N tags
2. Use 2 tags: latest revision and N-1 change history
3. ~~COM connectors, annotations, or auditing~~
4. I'm very patient; I'll wait for a new server
5. I have another idea (not #3)



PARALLEL UNIVERSE

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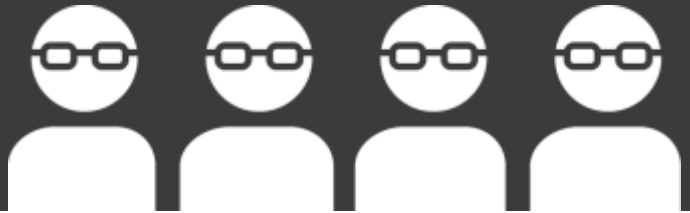
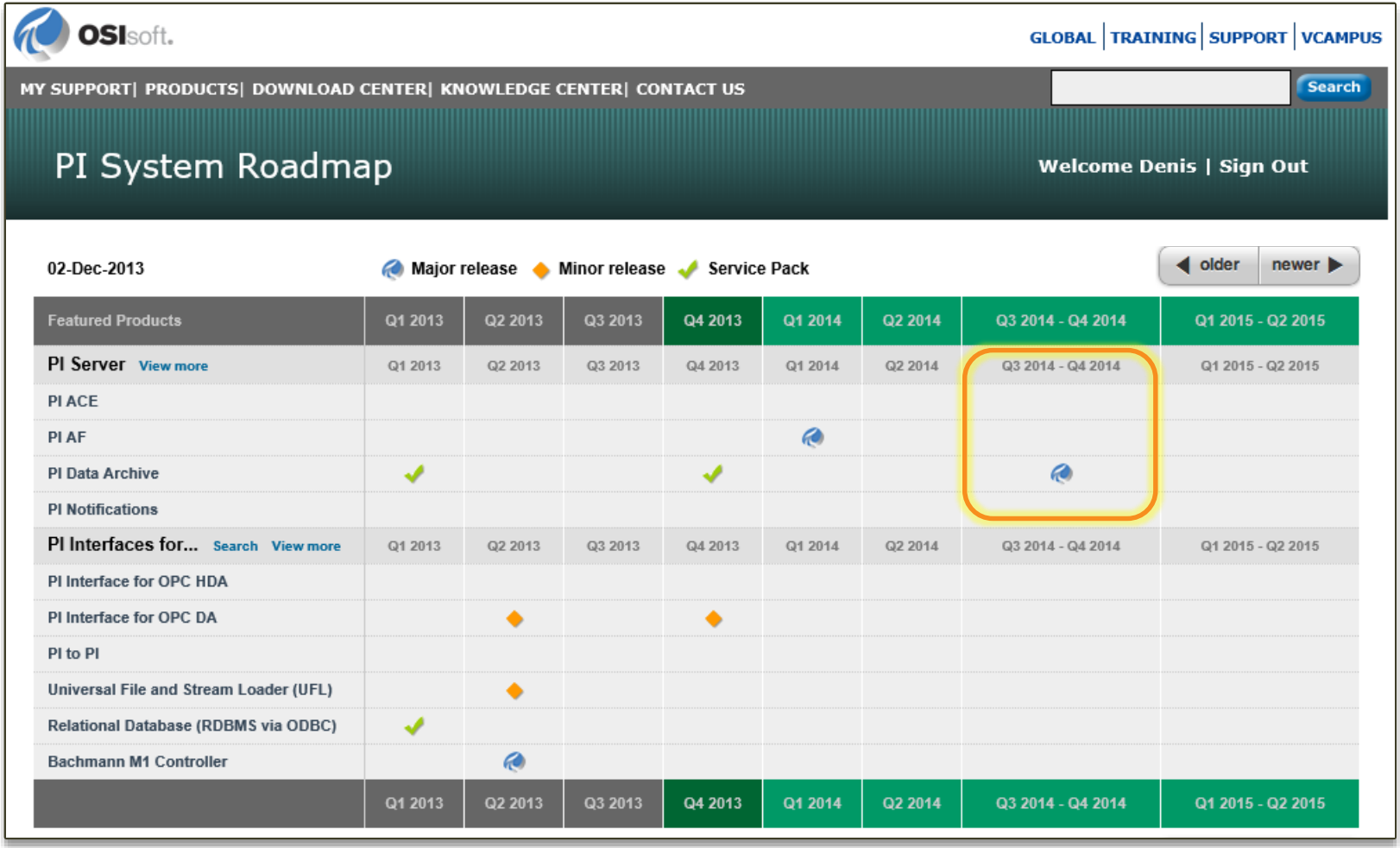
“Road” Map





Future Releases

1. PI Data Archive "DeLorean"
   - 1st Beta: UC San Francisco (March 2014)
   - Release: Q4/2014
2. Programmatic Access, PI Coresight, PI Cloud Connect, PI ProcessBook, and PI DataLink
   - Throughout 2014 and 2015
3. Other Client Products
   - TBD

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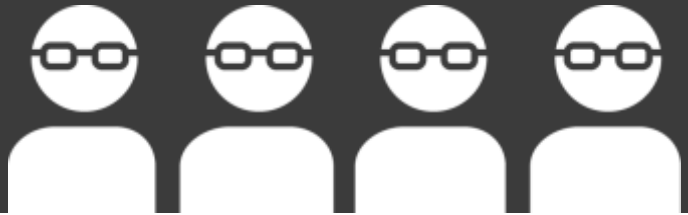

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