

Forecast Data, *Very* large PI systems, and bears – Oh My!

Keeping a history of the future in
PI – and being able to get
anything back out.....



Better than Magic 8-Ball?

- Forecasted data is becoming more common in T&D:
 - Load Forecast
 - Weather Forecast
 - Planned equipment outages (yeah, I know, you wish they were *planned*...)
 - 401K stock portfolio

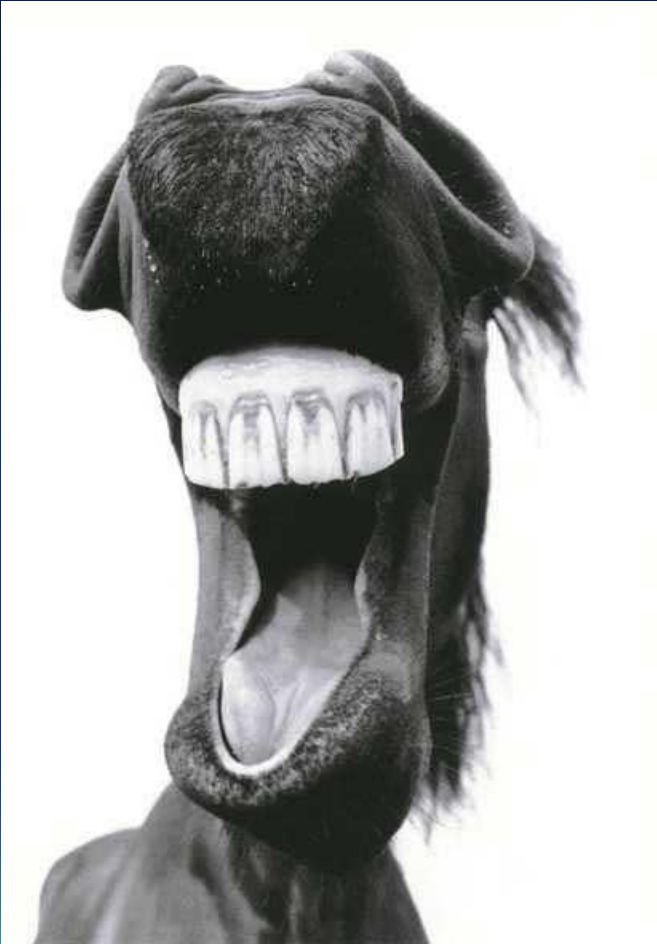


If it looks like a duck...

- Much of this info is time-series
- PI is the ideal engine for storing time-series data
- We already have PI
- The users like it
- OK! Put the forecast data in PI



WOAH!!!!



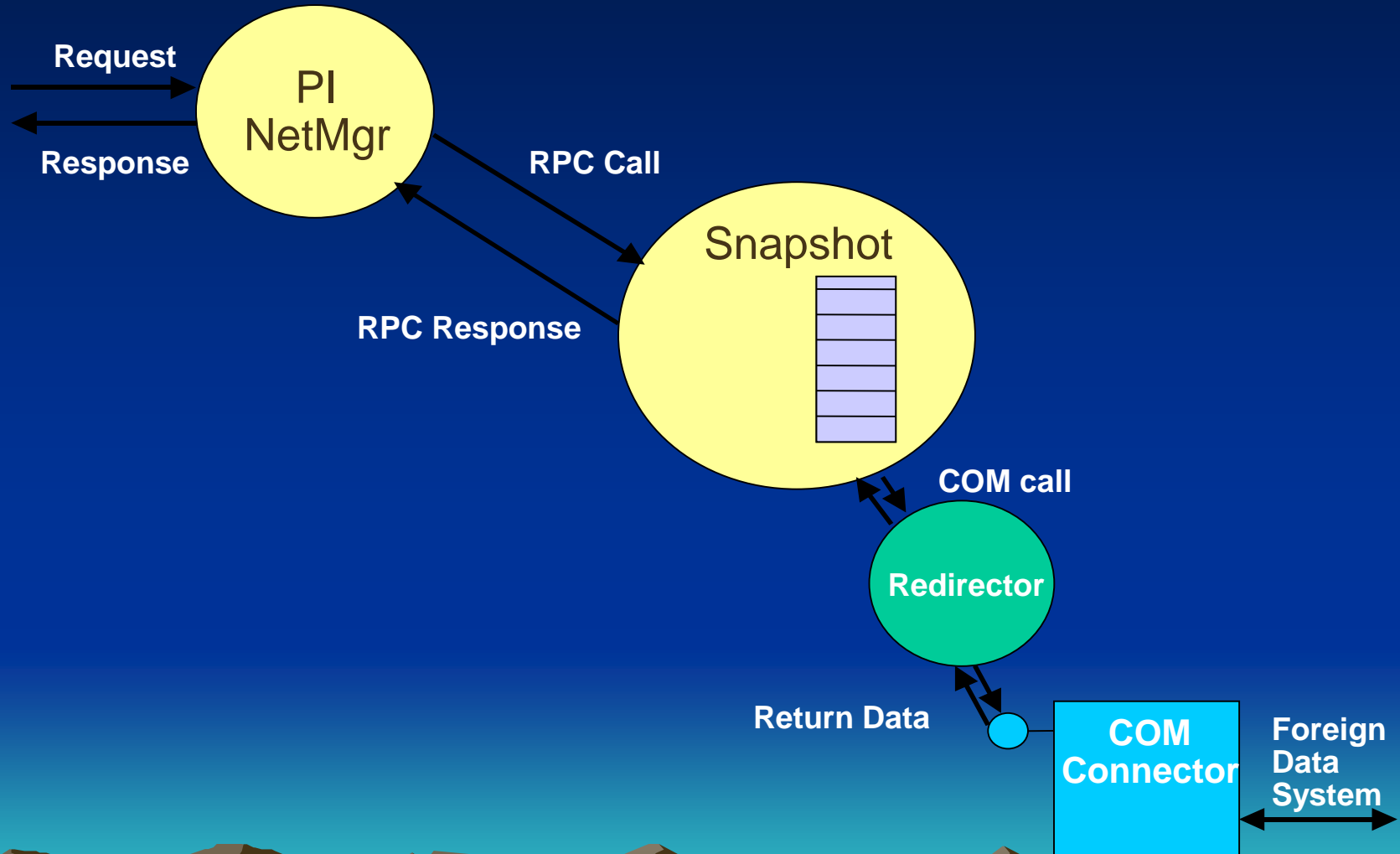
- PI doesn't like data with future timestamps
- The server will chuck anything with a timestamp of $* + 10m$ or greater into the proverbial bit-bucket.

So put the data in PI, only not...

- The rest of the PI system is fine with future data. Only the archive chokes on it.
- We need to access the data through PI, but store it elsewhere
- This is by definition what a COM Connector does



COM Connector Architecture



Our “Foreign System” is Oracle

- The RDBMS has all of the forecast data
- 1 row per hour, per forecast area
- Connecting to Oracle requires:
 - Oracle client installed **on the PI server**
 - Oracle credentials
 - Oracle DBA cooperation
 - Some knowledge of voodoo, possibly including a dead chicken to waive over the computer.



I'm connected, now what?

- COM Connector tags are the link between the PI world and the database world.
- Each tag gets an associated SQL statement to execute against the database.
- The COM Redirector takes care of executing these statements when PI clients ask for data.



Configuring COM Connector Tags

- Create OLEClass point class
 - Adds extra point attributes necessary to identify a COM Connector tag:
 - Ctr_progid: identifies which COM connector to use PIOLECTR.PIOLEDB
 - Ctr_udlpath: file with the DB connection instructions in it.
 - Ctr_compath: file with the SQL statements in it



Configuring tags (cont.)

- 5 or 6 SQL statements required
 - GetSnapshot (current value)
 - GetArchValue1 (get all the values)
 - GetArchValue2 (get the next archive value)
 - GetArchValue3 (get the prev. archive value)
 - GetArchValues (get all archive values between start and end times)
 - PutSnapshot (only if you need outputs)



access.ini - Notepad

File Edit Format Help

```
[GetArchValue1]
command=SELECT pitime, pivalue FROM table2 WHERE pitag='?' [PI.tag]

[GetArchValues]
command=SELECT pitime, pivalue FROM table2 WHERE pitime >= #?# AND pitime <= #?# AND
pitag = '?' ORDER BY pitime [CtrStartTime, CtrEndTime, PI.tag]

[GetSnapshot]
command = SELECT TOP 1 pitime, pivalue FROM table2 WHERE pitag = '?' AND pitime <=
Now() ORDER BY pitime DESC [PI.tag]

[GetArchValue2]
command = SELECT TOP 1 pitime, pivalue FROM table2 WHERE pitag = '?' AND pitime >=
#?# ORDER BY pi_time [PI.tag, CtrTime]

[GetArchValue3]
command = SELECT TOP 1 pitime, pivalue FROM table2 WHERE pitag = '?' AND pitime <=
#?# ORDER BY pitime DESC [PI.tag, CtrTime]

[PutSnapshot1]

[DEBUG]
level=0

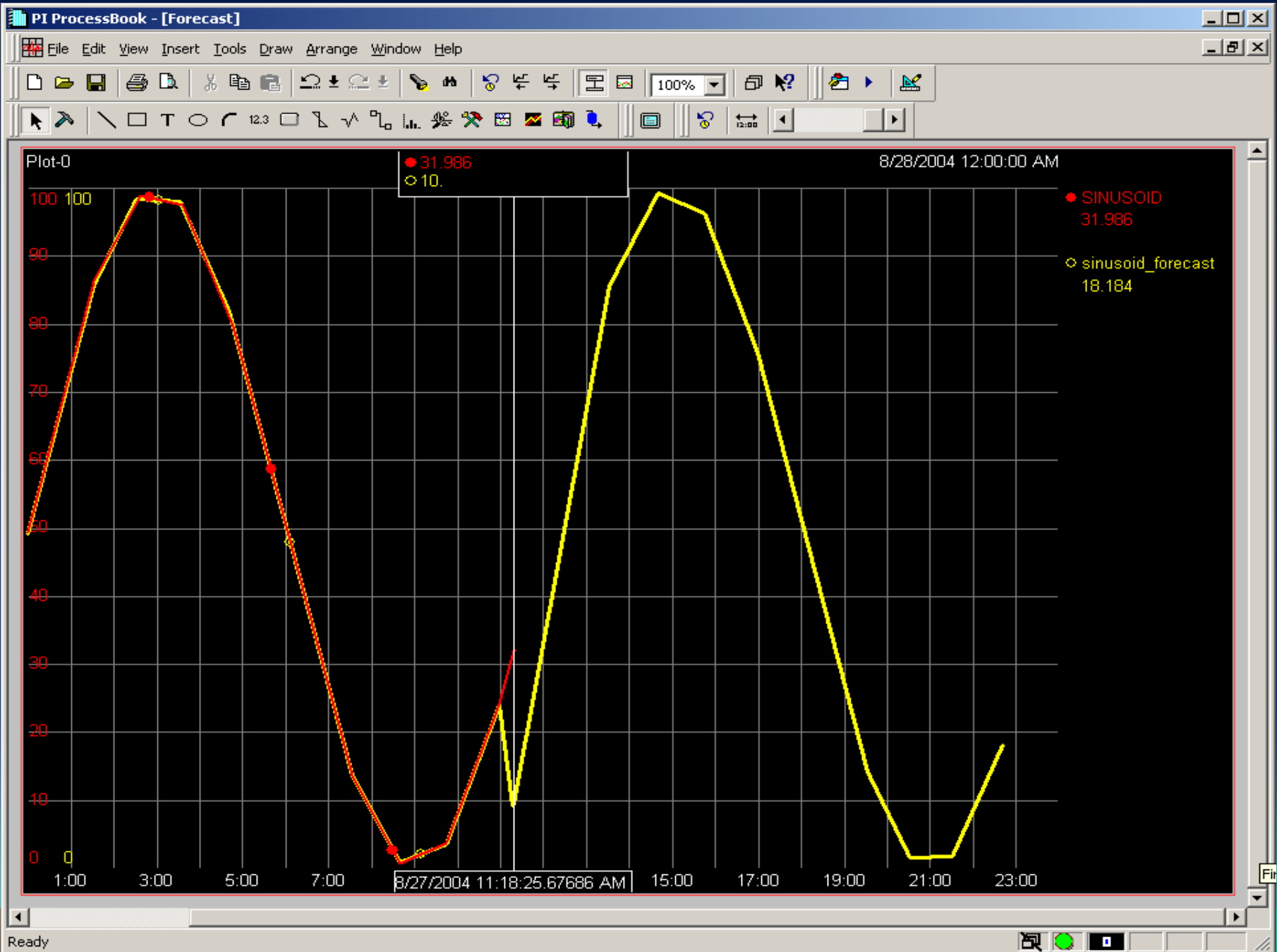
[UPDATE]
limit=15

[TIMESTAMPS]
TimeFormat = "hh':'mm':'ss tt"
DateFormat = "MM'/'dd'/'yyyy"
```

The Results...

- Once the COM Connector tags are setup, PI users are able to access data from the Oracle DB without ever knowing that they have gone outside of PI.
- And here's what it looks like in Processbook....





Sounds Great. What's the Catch?

- Setup Complication
 - Directly proportional to database complication
 - Inversely proportional to DBA cooperation
- Performance
 - The query from hell will take forever to come back with a result (if it doesn't timeout in one of six places first)
 - Because they are going through PI, the users will think that it's PI that's slow



What does the future hold for future data?

- As the data ages (a.k.a. is no longer future) – it can be moved into PI (RDBMS interface).
 - Separate Tag
 - If you want the data accessible through one tag, you can link the RDBMS back to PI using the PIOLEDB provider and 'linked servers'.
Good luck writing the SQL for this one....
- PI 3.5 is supposed to accept future data



Questions?

