

# WG - Services

- Focus on WMS
- Aim: **stick to existing standards whenever possible**, and map met. vocabulary to existing dimension, to be compatible with other WMS client (e.g. validity time mapped to <TIME> dimension)
- Note:
  - The “DIM\_” prefix is only used in requests, not in GetCapabilities documents. The standard must make that clear and should not use “DIM\_” when naming dimensions in the wiki or other documentation (see practice of other WG)

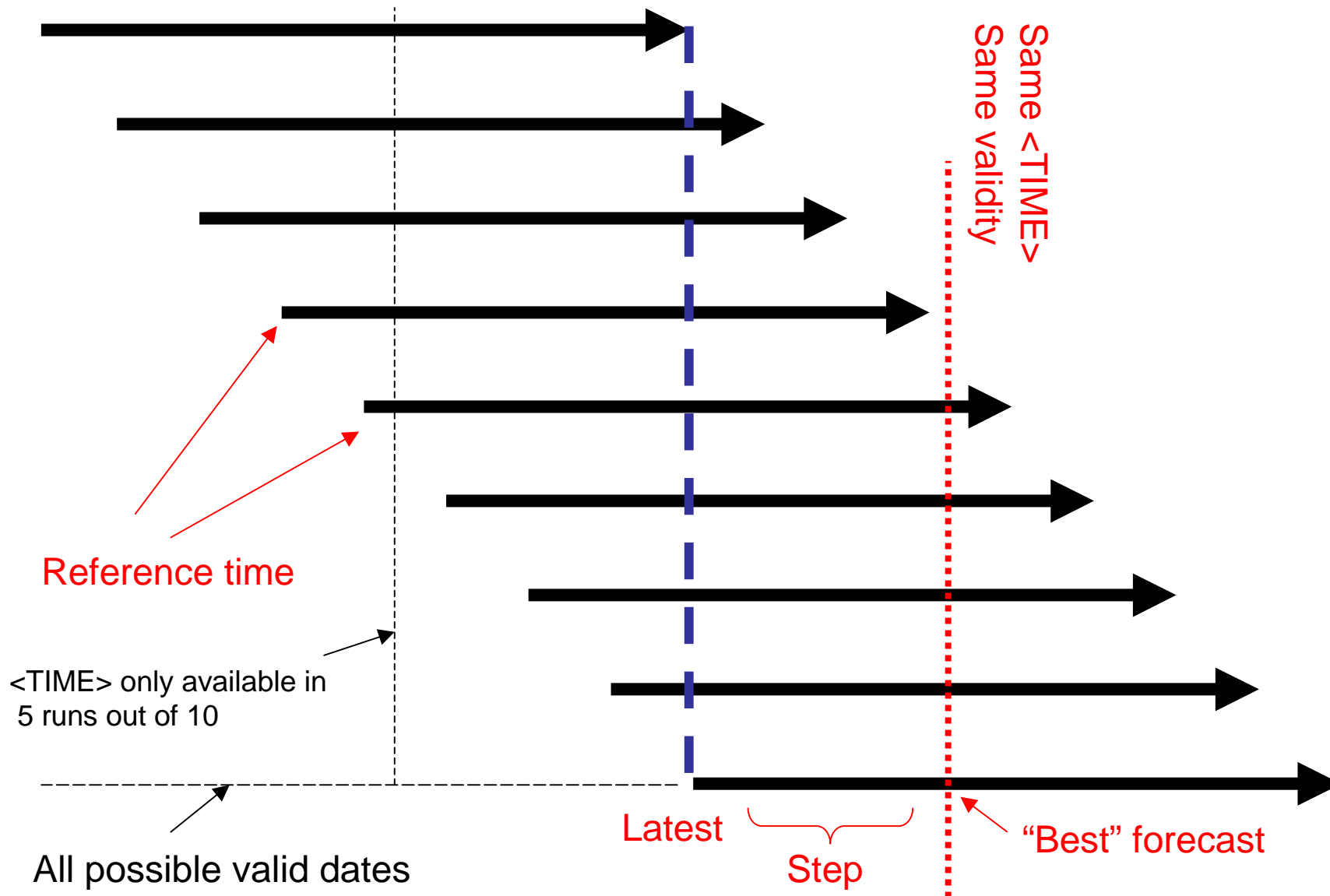
# Time

- Consecutive calls to GetMap on the same layer may deliver different images:
  - When new observations are available (or corrected)
  - When a new model run is available
- Use of default (e.g. latest or “best”)
  - Most of the time latest = best
  - But will break caching
  - How often should a client call “GetCapabilities”?
    - Could this information be provided as part of the GetCapabilities document itself?
    - Or provide layer update frequency? (This may already be part of related metadata, e.g. associated WMO core record)

# The time parallelogram

(is not a rectangle...)

*Past* ← — — — — — → *Future*



# Time – Vocabulary (Forecast)

- Run:
  - Base time, reference time, run (hour | time)
  - Forecast reference time (CF)
  - We need a default (e.g. latest) for support for WMS clients
- Forecast time
  - Valid time, Validity time, verification time
  - (Just) Time (CF)
  - Proposal: GetCapabilities <TIME> extents only contains the absolute date/time for the latest forecast
- (Time) Step
  - Forecast offset
  - Do we really need the step? (**YES**)
  - Useful for animation
- Reuse GRIB2, BUFR or CF names when possible
- <TIME> dimension is compulsory (in GetCapabilities)

# Time – Vocabulary (Forecasts ranges)

- Accumulation, Min/Max, averages,...
  - Practice: several...
    - [Start step, end step]
    - [Start , Start + range]
    - [Middle – range/2 , Middle + range/2]
    - [End – range, End]
  - What is the validity time?
    - Average: in the middle
    - Accumulation: at the end
    - Min, max?
  - Again, check what is done in CF, GRIB2, BUFR

# Proposal 1

- For a given <LAYER>, the <TIME> dimension refers to the most recent <REF\_TIME>

<LAYER>

<TIME>T1 , T2 , T3</TIME>

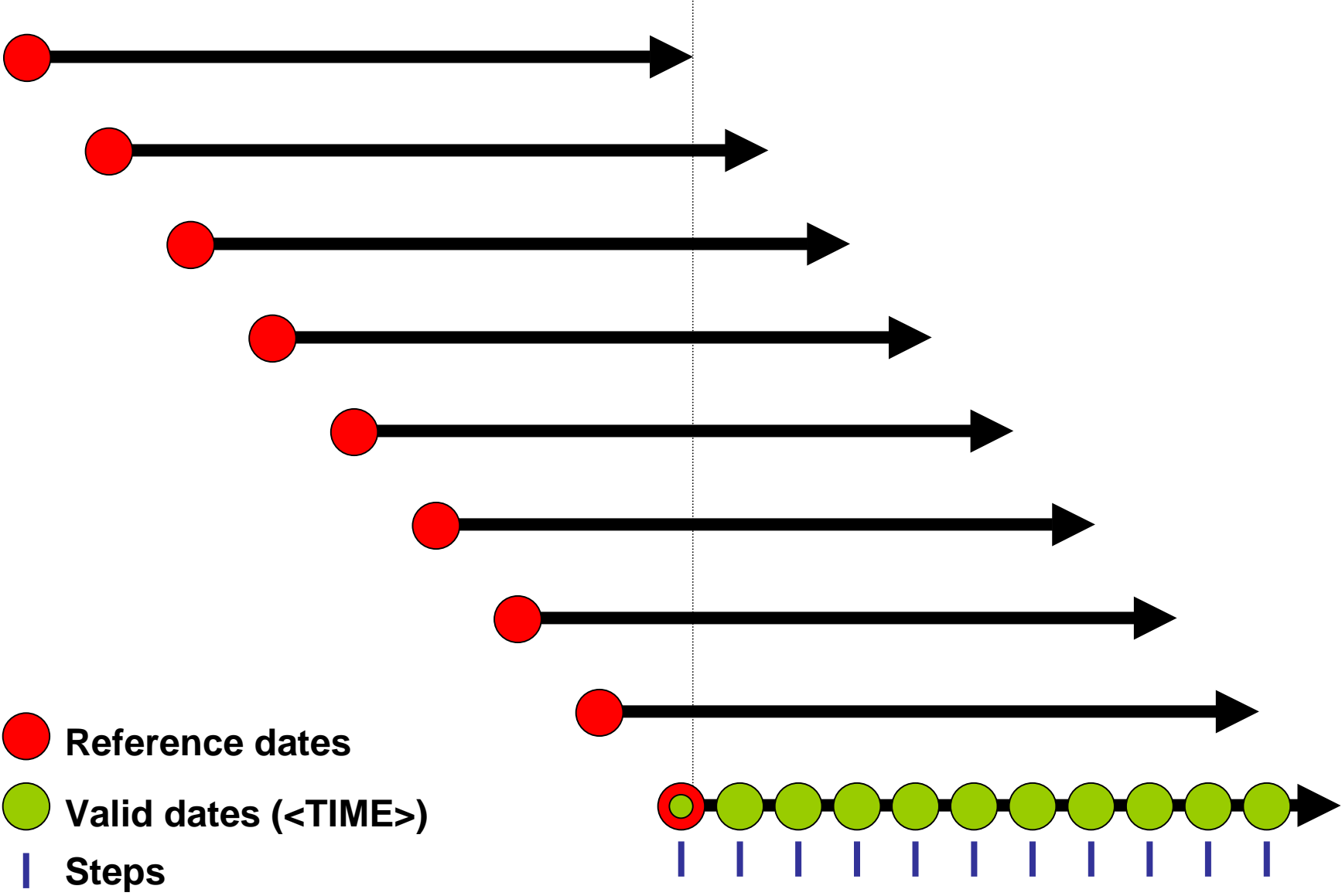
<STEP>S1 , S2 , S3</STEP>

<REF\_TIME default="R3">R1 , R2 , R3</REF\_TIME>

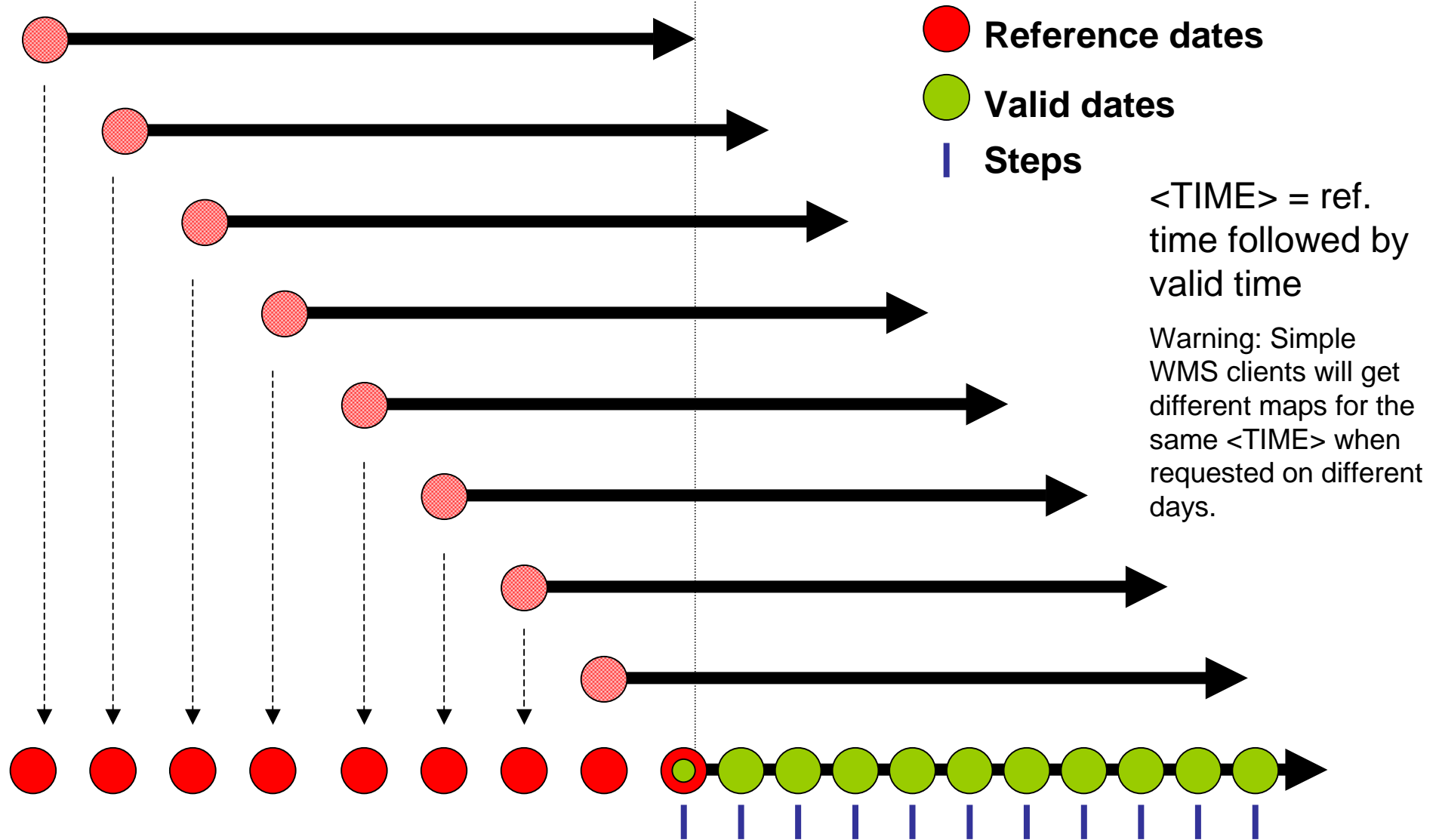
</LAYER>

- T1 , T2 , T3 which  $T_i = T_3 + T_i$
- Otherwise there should be  $3 \times 3 = 9$  TIMES, and all combinations of TIME/STEP/REF\_TIME may not be valid
- Assumption: S1, S2 and S3 are valid for R1 and R2
- Advantage: compatible with simple WMS clients

# Proposal 1



# Proposal 1.5 (best estimate time series)





# Proposal 2

- Use layer hierarchy, group all forecast of the same model for different runs
- Parent layers hold common attribute

```
<layer name="temperature" title="Best estimate (forecast +
previous analysis)">
  <elevation>1000/850/500</elevation>
  <time>a0,a1,...,t1,t2,t3</time>
  <layer name="temperature_0" title="Current forecast ">
    <time>t1,t2,t3</time>
  </layer>
  <layer name="temperature_1" title="Yesterday's forecast">
    <time>t0,t1,t2</time>
    <metadata>... reference date goes here ...</metadata>
  </layer>
  <layer name="temperature_2" title="The day before yesterday's
forecast" >
    • ...
```

- Issue: difficult to manage (produce and use), generate large GetCapabilities.
- Compatible with existing WMS client
- Does not represent impossible combinations (unlike proposal 1)
- **To be further explored...**

# Vertical coordinates (elevation)

- Several ways:
  - <elevation units="hPa">1000, 500, 200</elevation>
    - standard, need to define a vertical CRS for hPa
    - MetOcean needs to define missing vertical CRS (check with INSPIRE)
  - <elevation units="any">1000hPa, 500hPa, 10m</elevation>
    - not standard?
  - Any other <dimension>
  - Investigate UCUM, ISO 19111-2

# Other dimensions

- When a layer needs to be parameterised, how to decided whether to use a new dimension, or make the parameter part of the layer name
- Should we agree on the names of all <dimensions> and the range of values of <extents>, or should WMS client be ready to support for any names
  - E.g. Should the name “forecast\_probability\_threshold” be agreed by the community
  - In short, should we give any semantic to dimension names, or are they just character strings
- WMS allow clients to ignore dimension
- **Recommendation: MetOcean group to provide governance on dimension names (MetOcean checked if the dimension has already been proposed, process similar to CF convention)**

# General issues

- Layer names should not have any semantics
  - Semantics go in a dimension
- Tiles/Images should come back with associated metadata
  - Geo-location
  - Time
  - Other dimensions
- Notification
  - Availability of new model run

# Other issues (not discussed)

- CRS
  - Vertical longitude of polar stereographic
  - Date line (anti-meridian)
- Styles
  - Is SE (Symbology Encoding) sufficient for our community?