

SciGRID_gas: Merging data sets

Jan Diettrich & Adam Pluta

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SciGRID_gas: Merging data sets

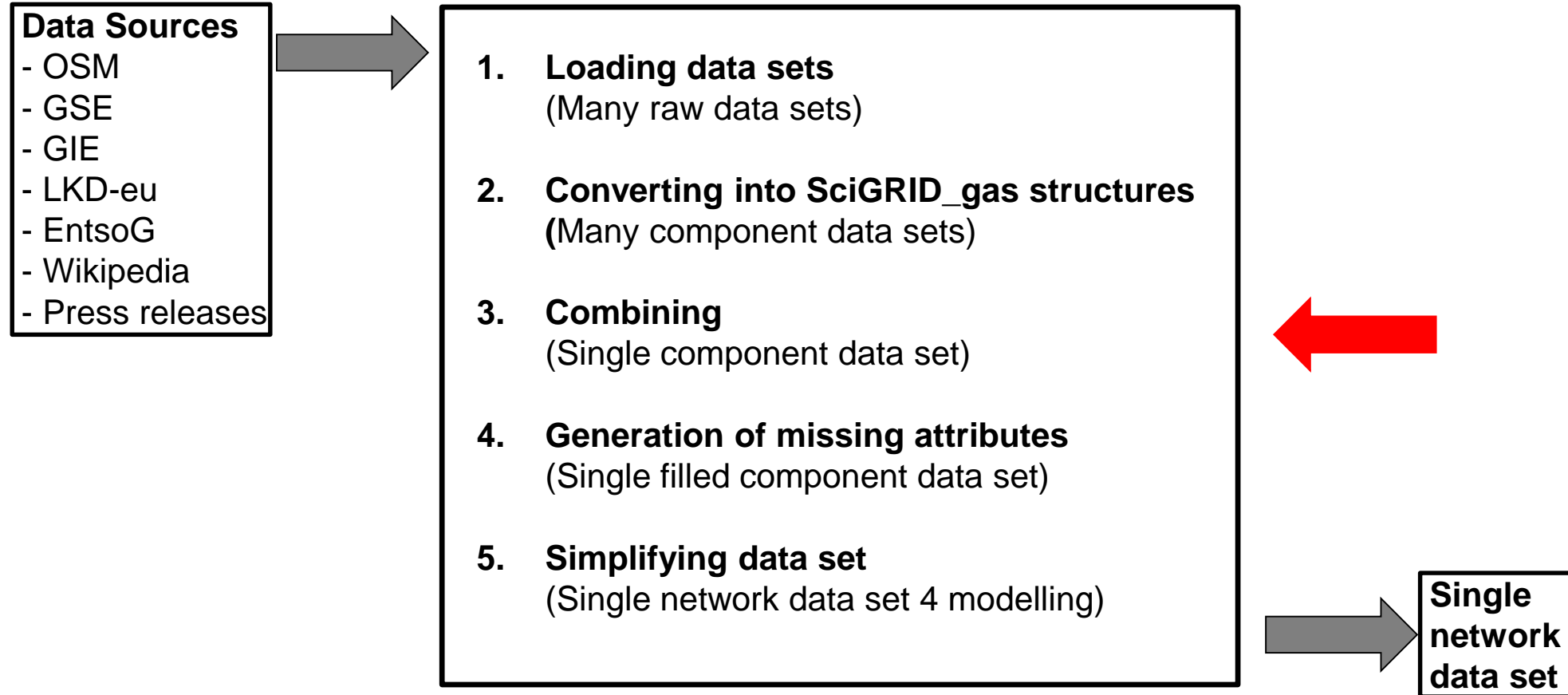
DLR Institute of Networked Energy Systems



Knowledge for Tomorrow



Pathway



Methods of merging data sets

Point components

- LNGs
- Storages
- Consumptions
- Compressors

Pipe components

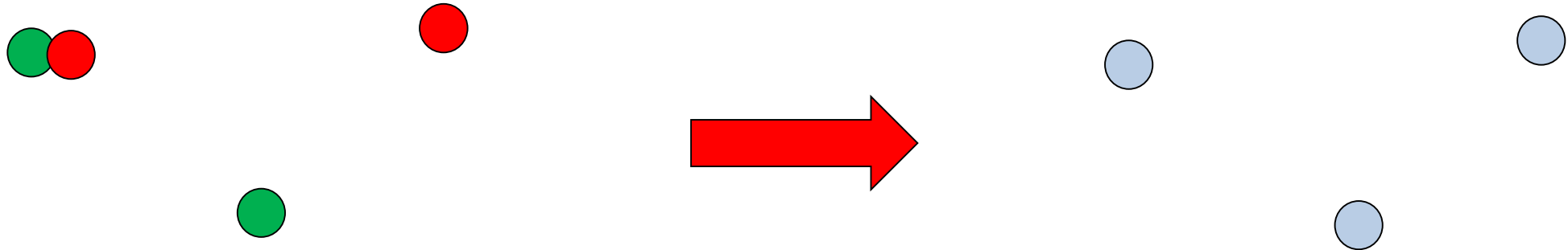
- PipeLines
- PipeSegments



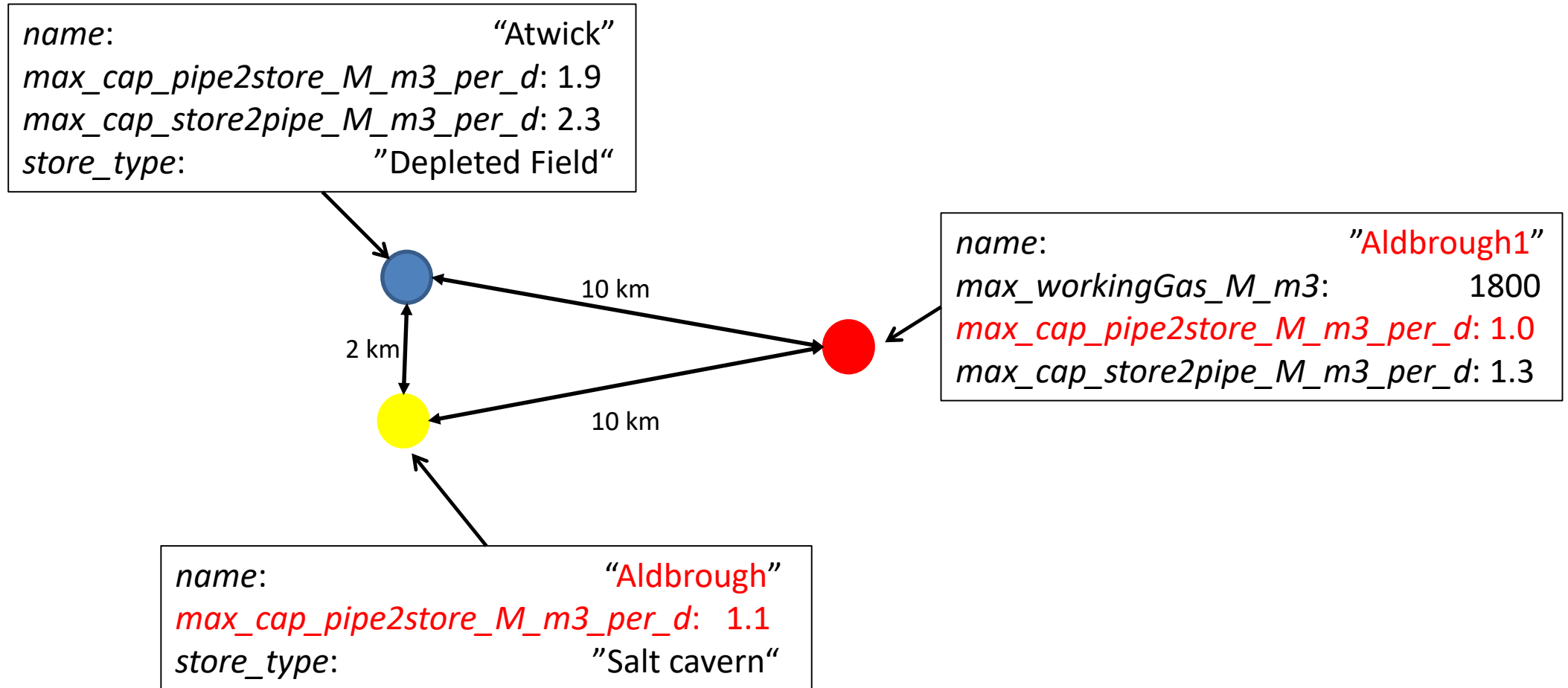
Merging point components

- Merge based on
 - Lat long position
 - Based on name

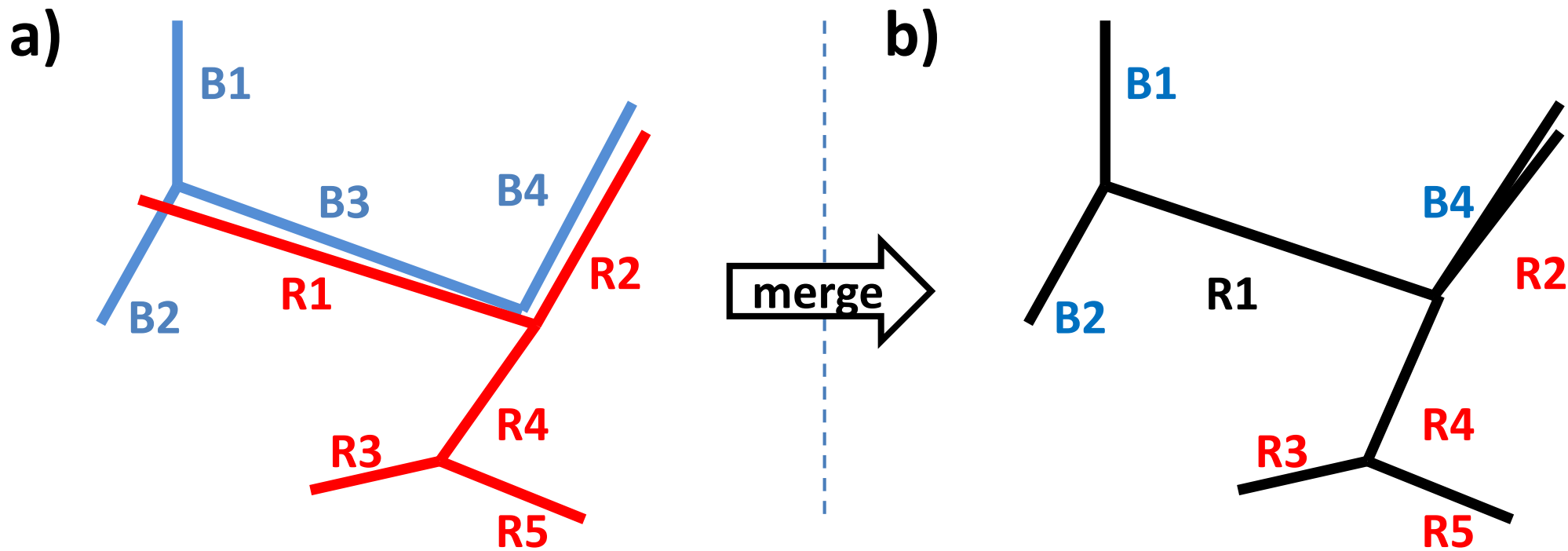
- Using FuzzyWuzzy
- Threshold approach



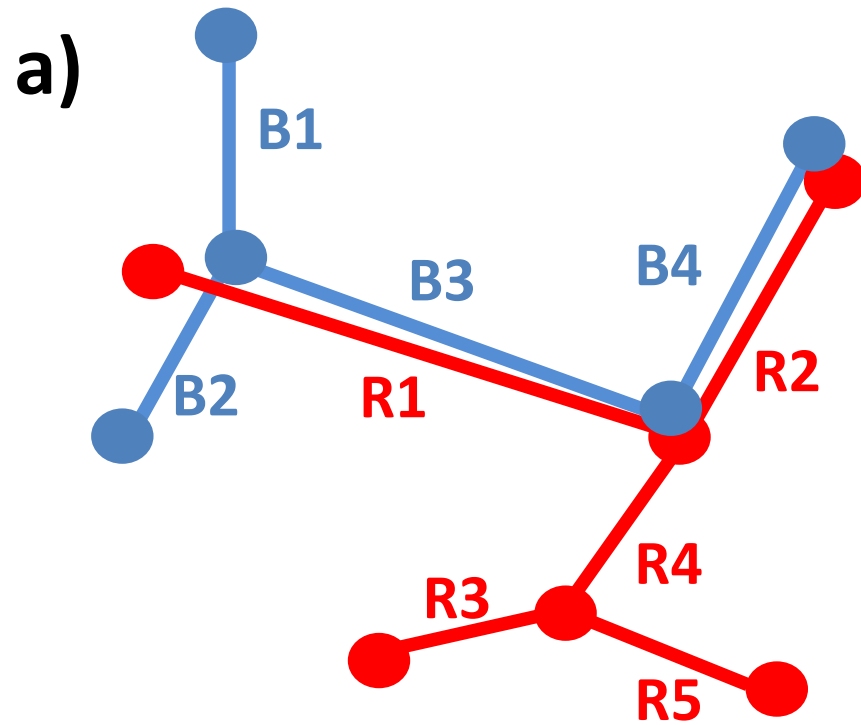
Merging point components



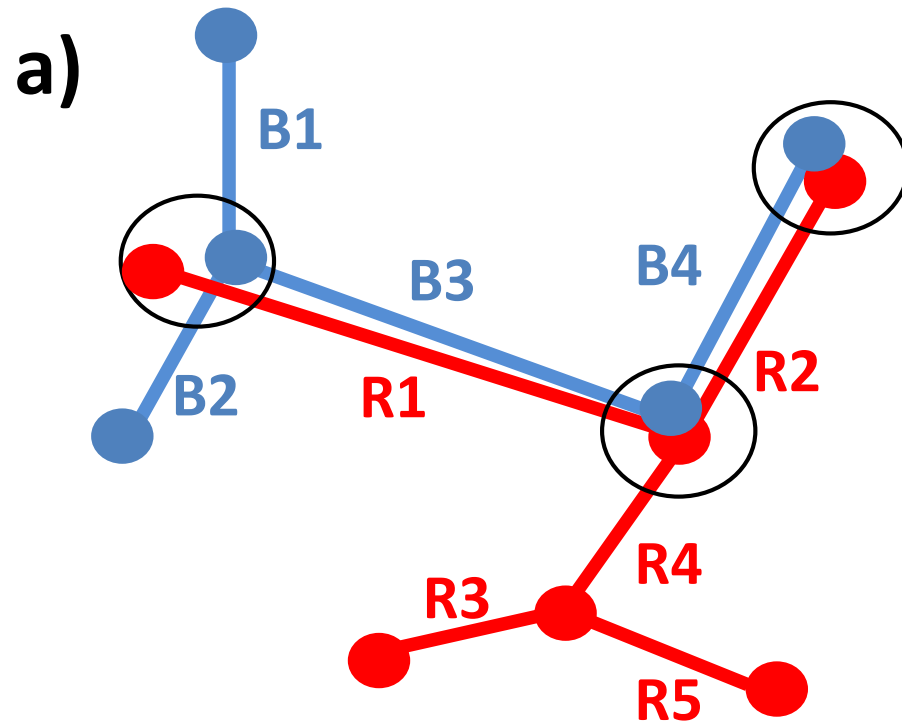
Merging of pipes I – (endnodes and parameter based)



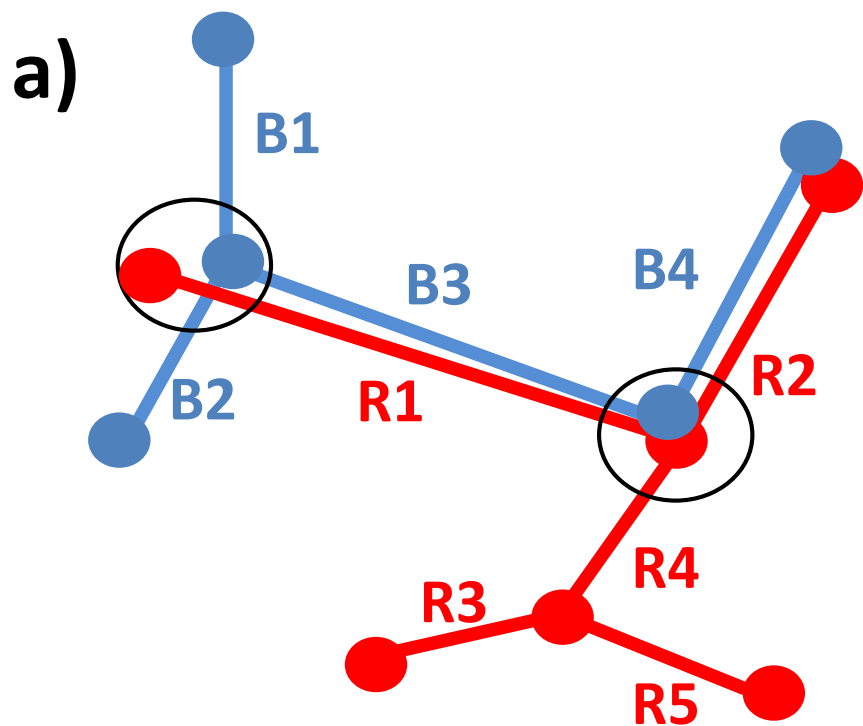
Merging of pipes I



Merging of pipes I



Merging of pipes I



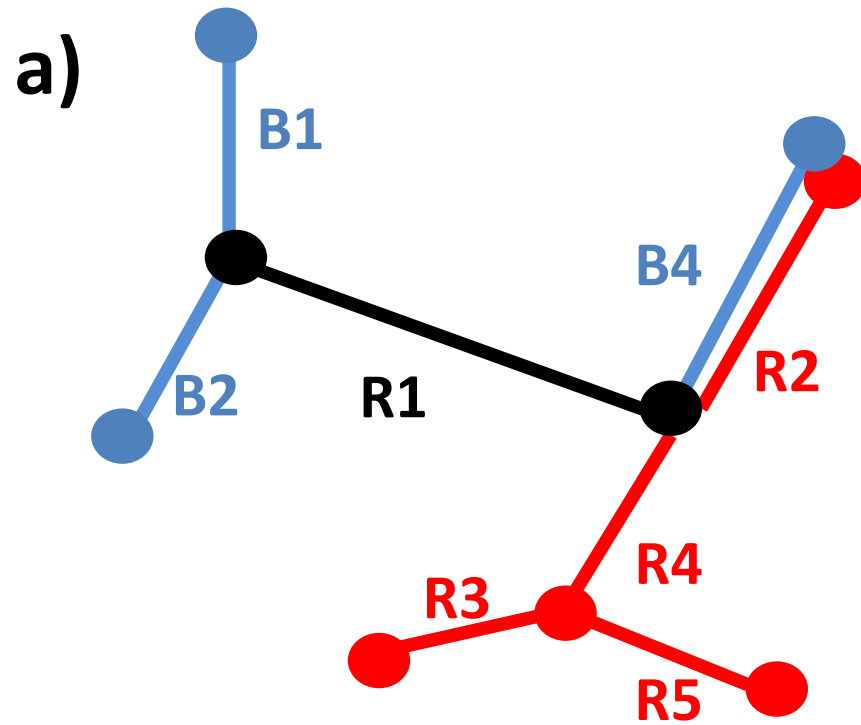
attribs \approx **attribs**

length \approx **length**

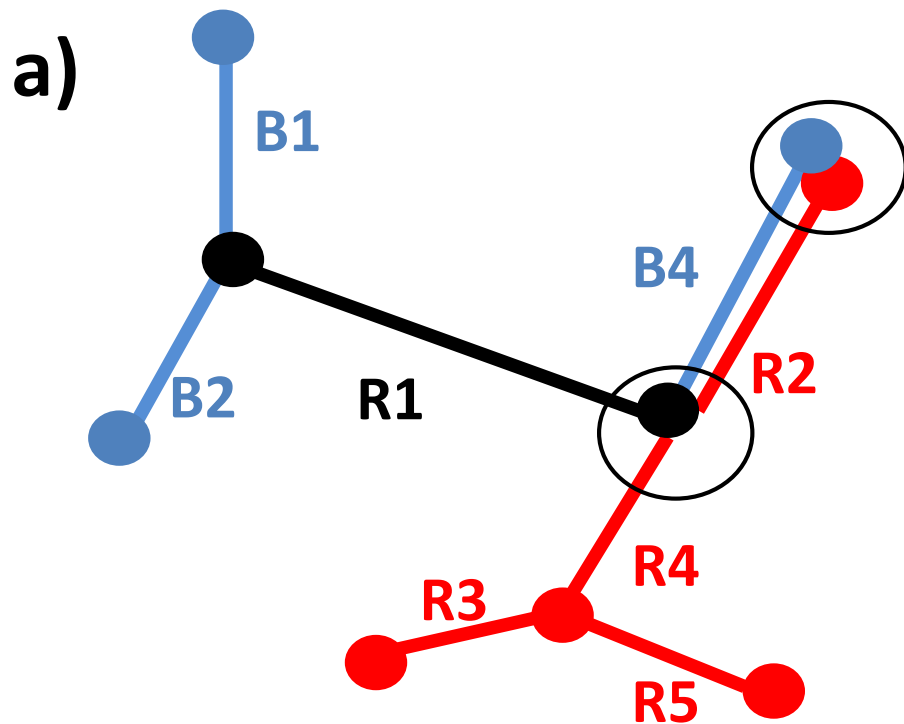
→ **Same pipe**



Merging of pipes I



Merging of pipes I



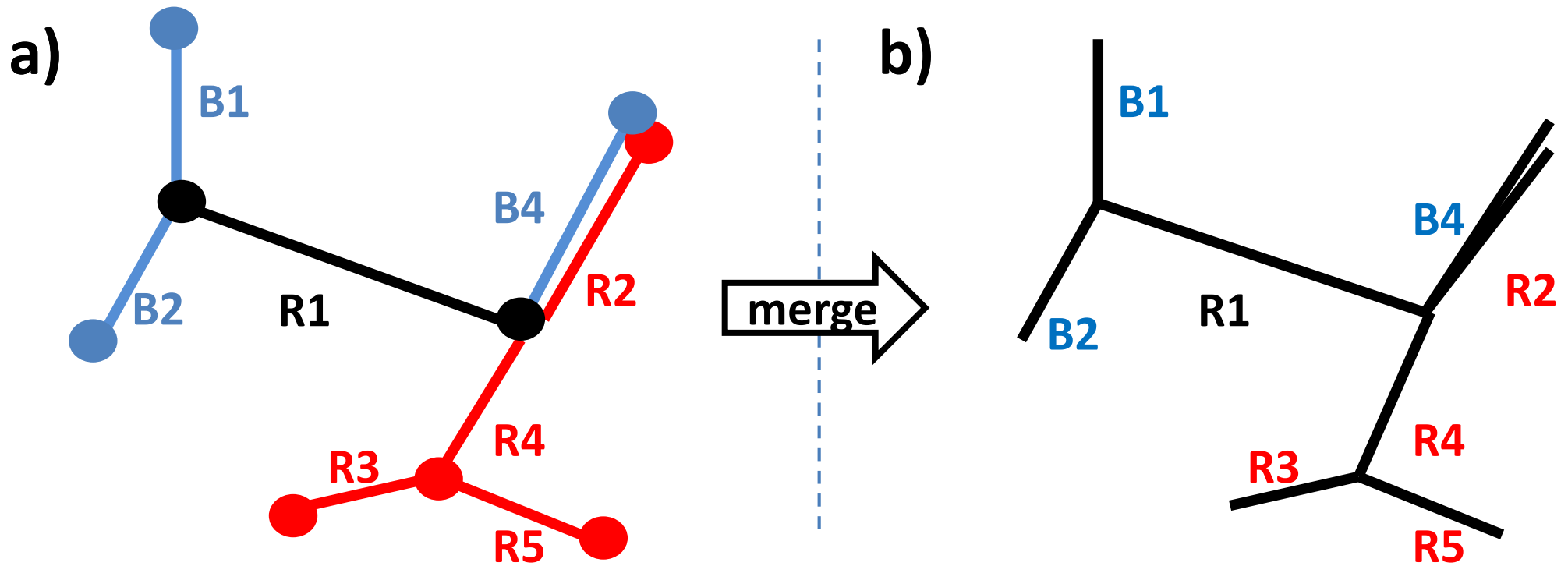
attribs << **attribs**

length \approx **length**

→ **No Merge**

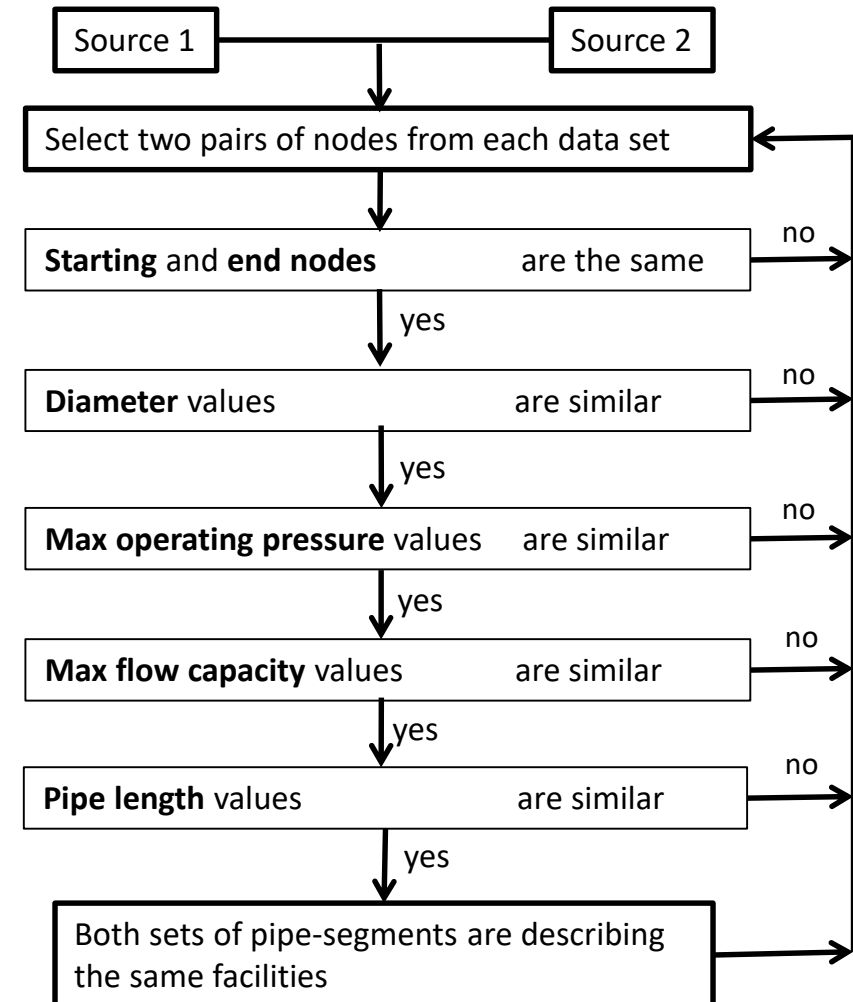


Merging of pipes I



Merging of pipes I

- Look for node pairs
- Look for pipes between node pairs
- Check attributes (+/- 5-10%)
- Check lengths (+/- 20–150%)



Merging of pipes II – (topology based)

Subjects:

Segmentation of pipelines to nodes

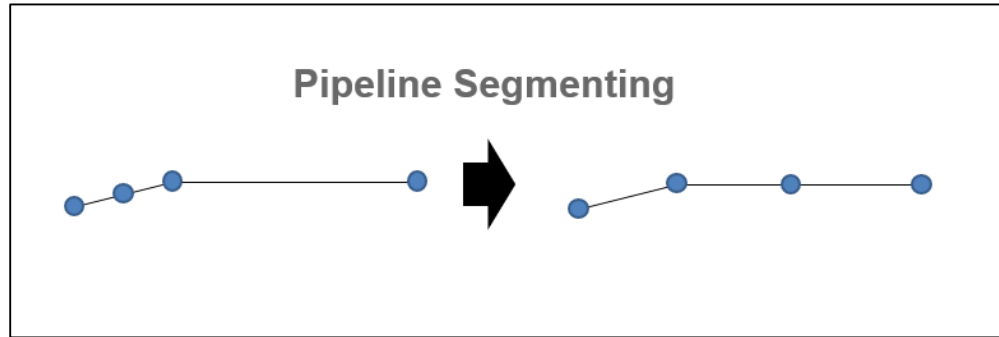
Merging nearest nodes from different

Meta data transfer

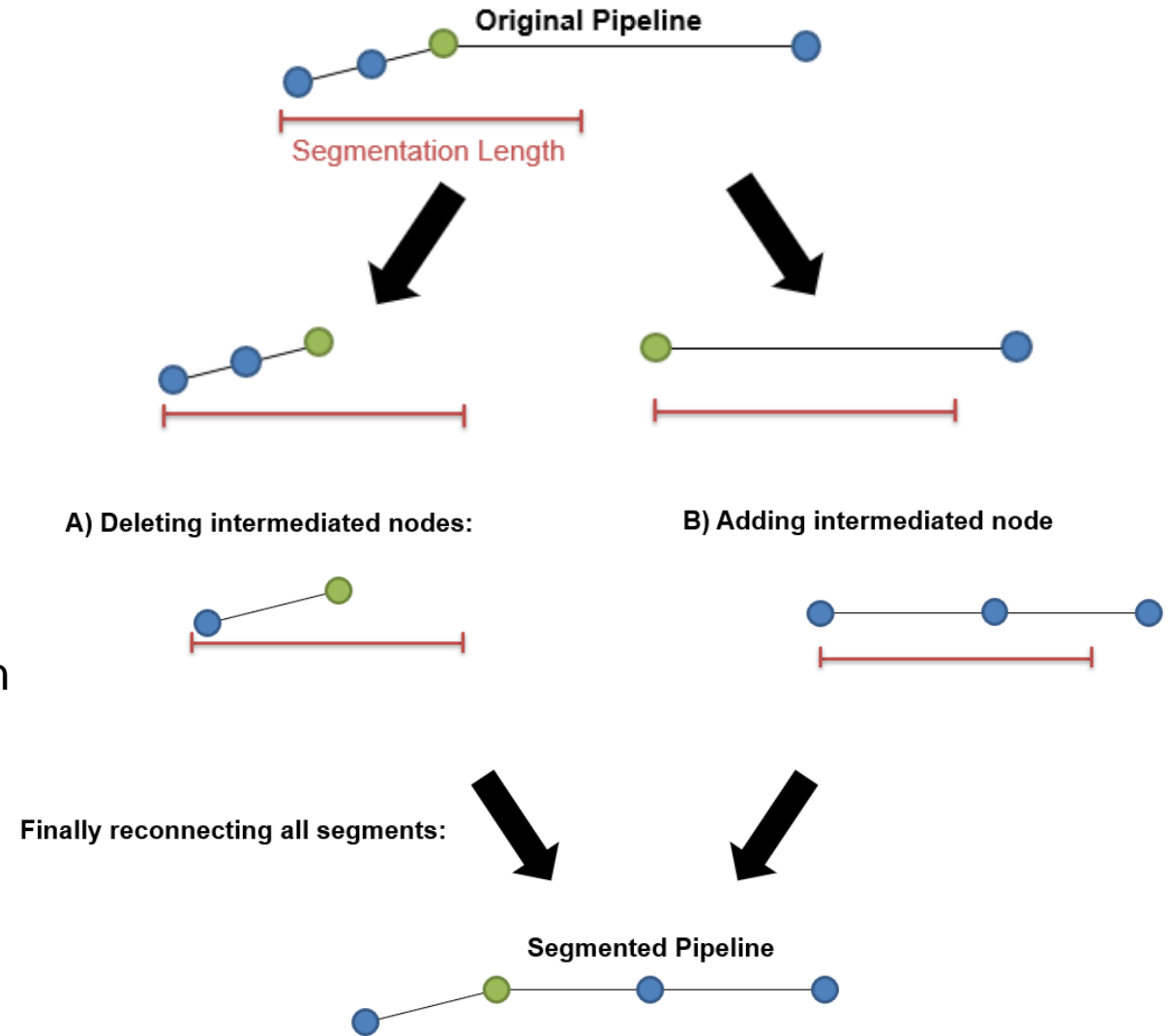


Merging of pipes II

Task:

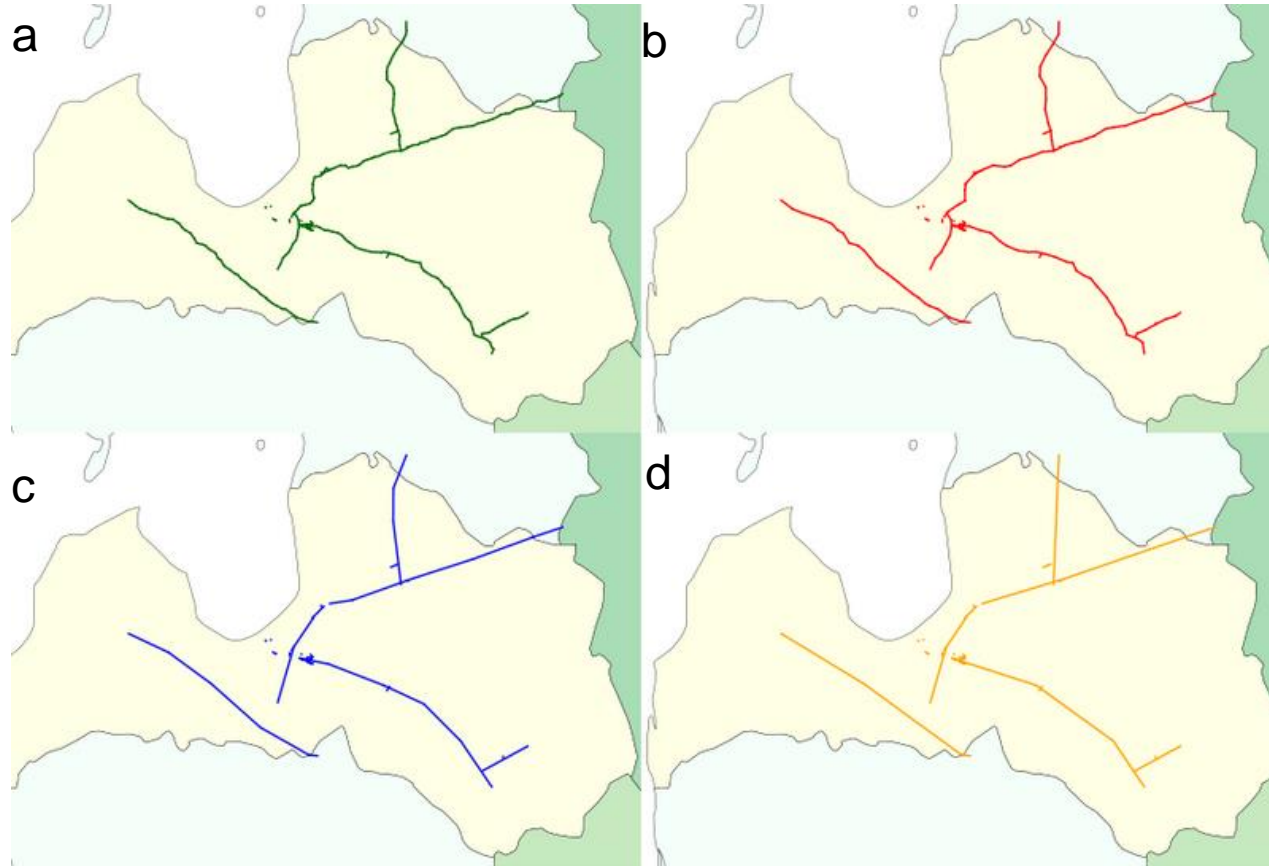


minimize node count and keep original information



Merging of pipes II

Example: Segmentation of OSM gas transport pipelines of Latvia



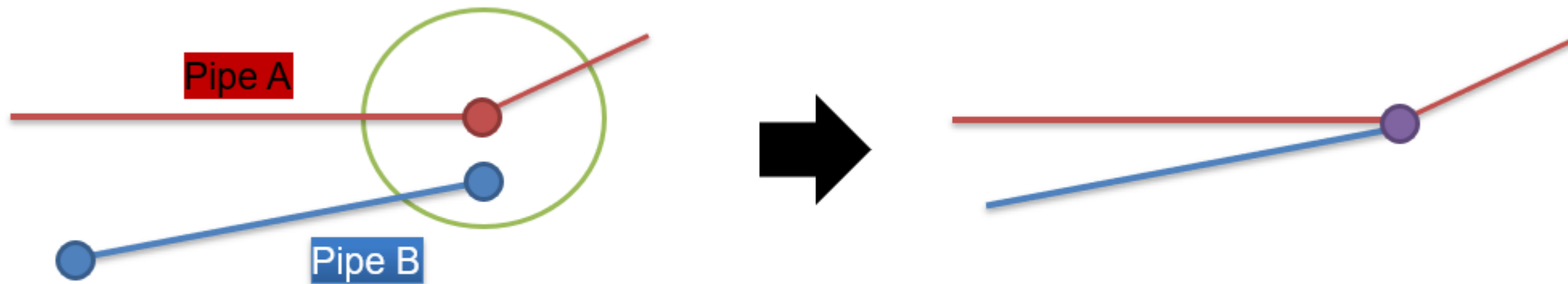
max_segment_length

- a) 5 km
- b) 10 km
- c) 50 km
- d) 100 km.



Merging of pipes II

Merging two nearest nodes if distance < max_merge_radius



Condition:

max_merge_radius < segment distance

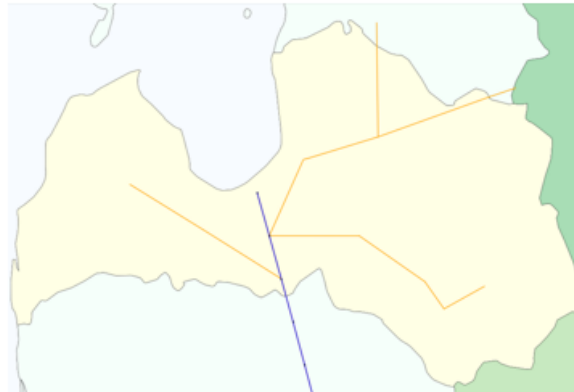
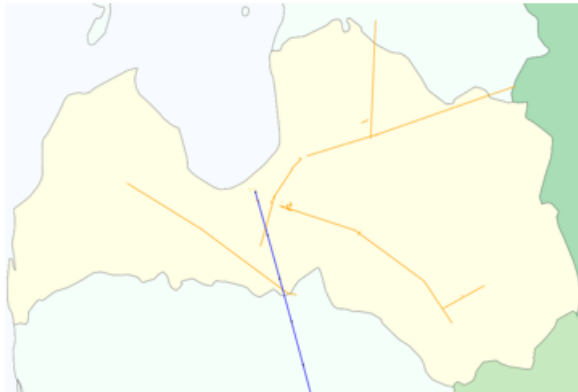
Advantage:

- two smaller distance matrices -> fast
- keep parallel pipes
- disconnected crossing pipes
- can conserve topology of the (dominant) dataset



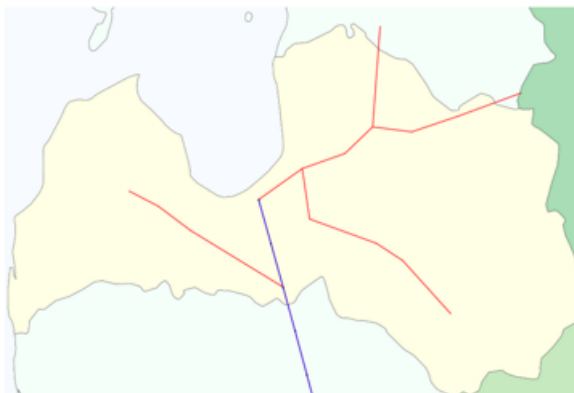
Merging of pipes II - Merging INET(blue) and OSM

Example: Merging OSM and INET pipelines of Latvia



max_segment_length
100 km

min_segment_length:
5 km



max_segment_length
10 km

min_segment_length:
5 km

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Merging of pipes II - Application I : Create New Pipelines

Example: Adding pipelines from OSM to INET



black: OSM, blue: INET

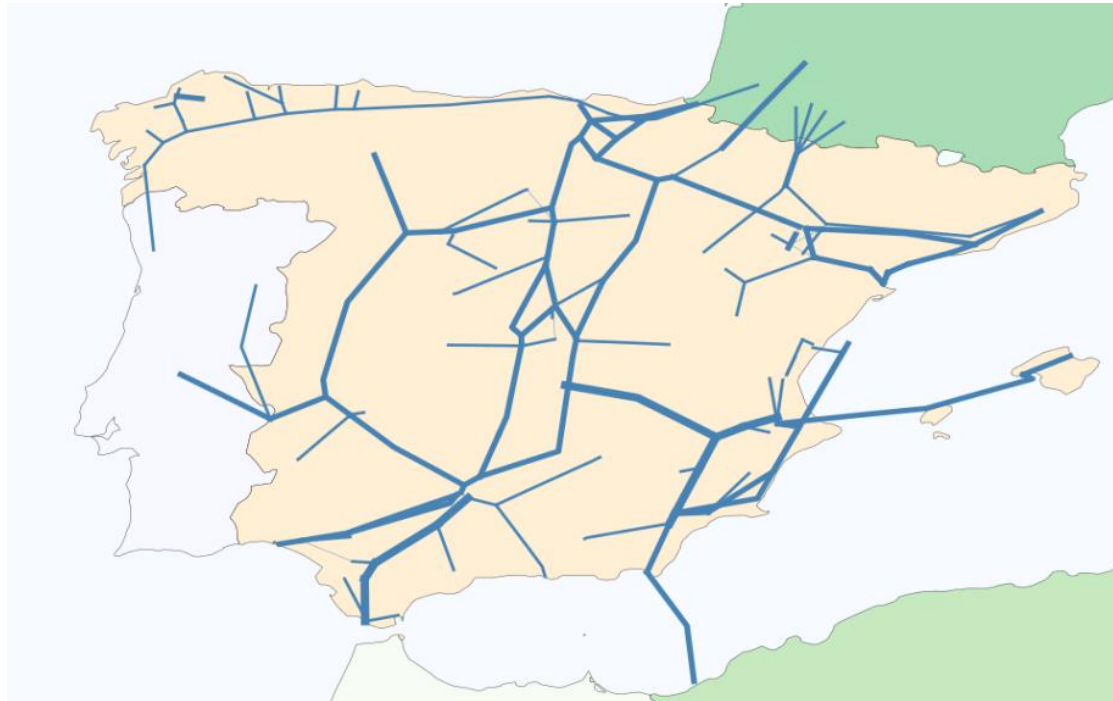


blue: merged network



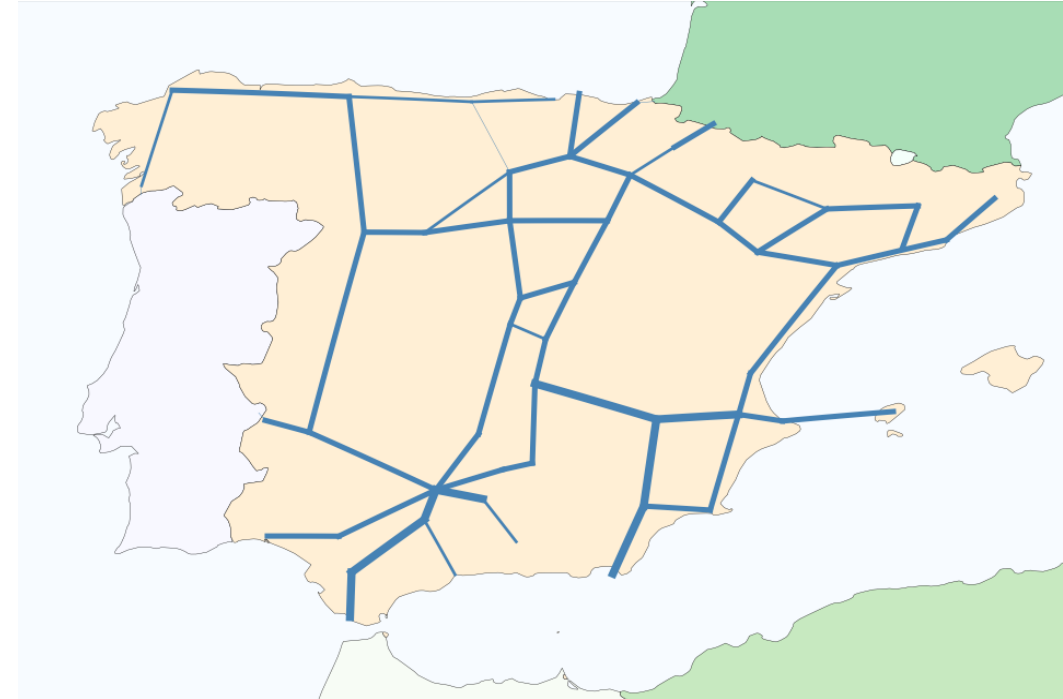
Merging of pipes II - Application II : Tranfering Meta Data

Example: Transferring from Meta data from EMap to INET



Meta data : pipeline classes (S,M,L)

EMap



INET



Merging of pipes II - Application II : Tranfering Meta Data

Method for transferring pipe meta data:

Networks : A, B

- 1) parameter of pipelines A -> nodes A (but not end nodes)
- 2) parameter nodes A -> nodes B (nearest neighbor)
- 3) parameter nodes B -> pipeline B (via decision function)



Parameters on pipeline
middle nodes (blue)

Decision function:

- max count value
- max value (see. previous example).



Questions??

