A Holistic View of Security and Privacy Issues in Smart Grids

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What are the key research challenges in security & privacy for smart grids?
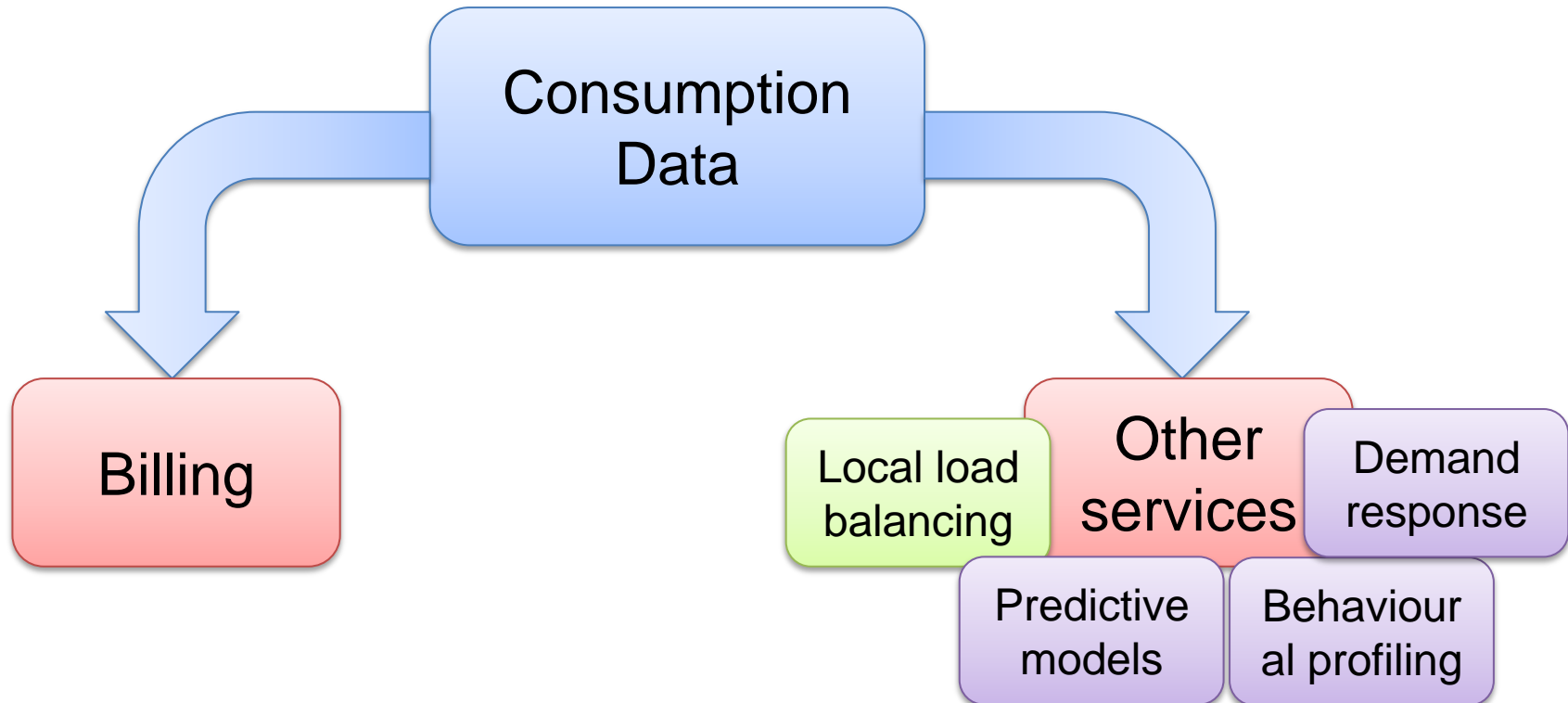
Why security & privacy in Smart Grids?

Why consumption data only?

What is consumption data useful for?

Is energy consumption data ***personal data***?

Yes (*)

(*) Opinion issued by the European Data Protection Supervisor on 8/6/2012

Subject to EU Directive 95/46/EC

Recap

- Smart grids will be characterized by huge amounts of data

- Consumption data is the one with the largest innovation potential and business value

- Consumption data has to be considered personal data and hence subject to EU/National privacy regulations

How to ensure privacy of consumption data while unleashing its innovation and business potential?

(considering the rather complex structure of energy value chain)

#1: How to make energy consumption data *confidential*?

#1(b): How to make energy consumption *forecast* data confidential?

#2: How to ensure privacy of end users without relying on any trusted aggregator?

#3: What if the smart meter was not a fully trusted entity?

#4: How can the user control whether her data is processed as per consent?

#5: How to enforce access control without revealing information when the enforcing entity is honest-but-curious?

#6: How to ensure tamper-resistance and non-repudiation while preserving privacy?

#7: How to ensure availability in the presence of (D)DoS attacks?

#8: How to ensure *transparent auditing* and *verifiability* of consumption data?

#9: How to preserve privacy when users (or: agents acting on their behalf) bid on *energy markets*^(*)?

Are these new research challenges?

No.

The real challenge is to address them jointly in a holistic fashion

Design and development of a **secure data management framework** *able to cover the whole energy data life-cycle*

Thanks for your attention!

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SmartGridSec12