SPARK+AI SUMMIT EUROPE

Azure Databricks Monitoring Solar Farms

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#SAISDD11

About Us

- Richard Conway Founder and Director of Elastacloud, a UK Cloud Data Analytics Consultancy, Azure MVP/Microsoft Regional Director + Sandy May Cloud Big Data Surgeon
- Microsoft Azure Gold Partner, Cloud Platform and Data Analytics, OSS Partner of the year 2015, Microsoft Partner of the Year nominee 2018
- Co-founder of UK Azure User Group, IoT and Data Science Innovators UK, UK Cloud Infrastructure User Group
- Author of data science degree academy.microsoft.com
- Running AzureCraft in UK annually
- Contributors to open source, several Apache projects including Storm, Spark, Libcloud and Parquet
- 50+ people, offices in London, Nottingham and Spain

What we'll cover in this presentation

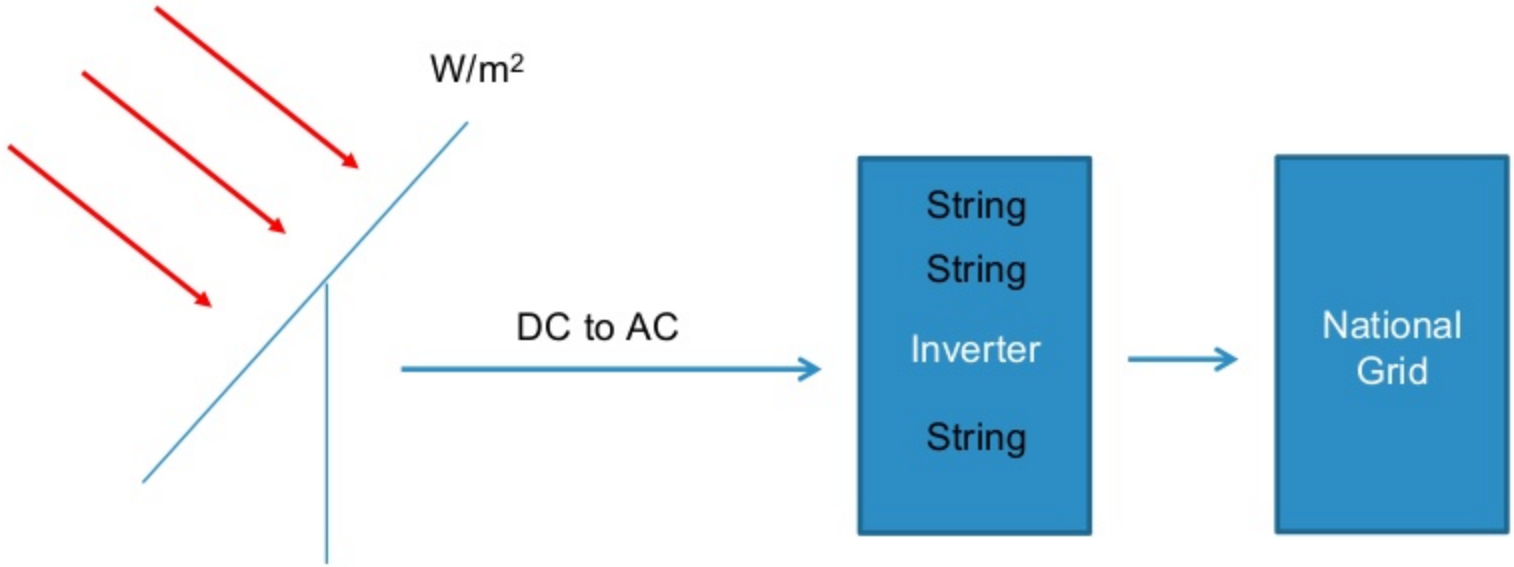
- A little about solar and renewables data acquisition
- A little about Azure and how we design things
- Using Databricks in a fun way
- Orchestrating the future

The Solar Farm

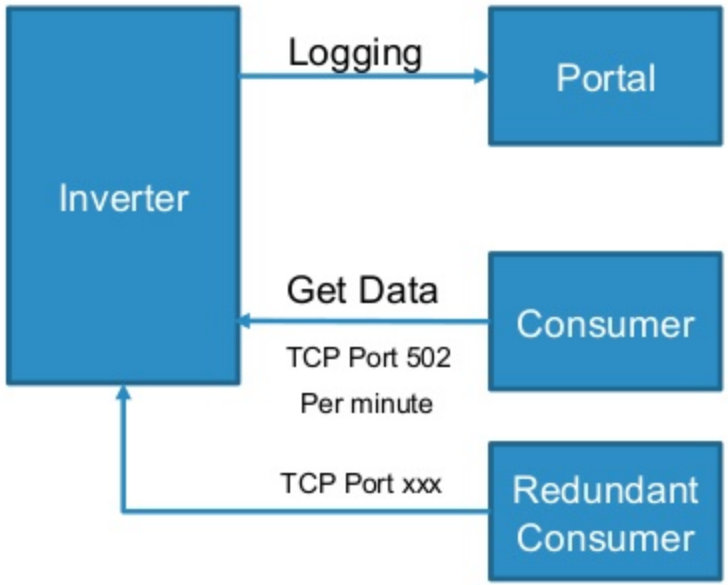
images from mnn.com

Courtesy Wikipedia – installed UK capacity ~ < 10GW

Solar Irradiance

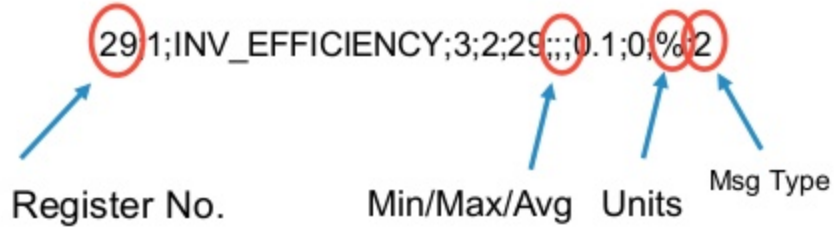


Modbus Collection of Data

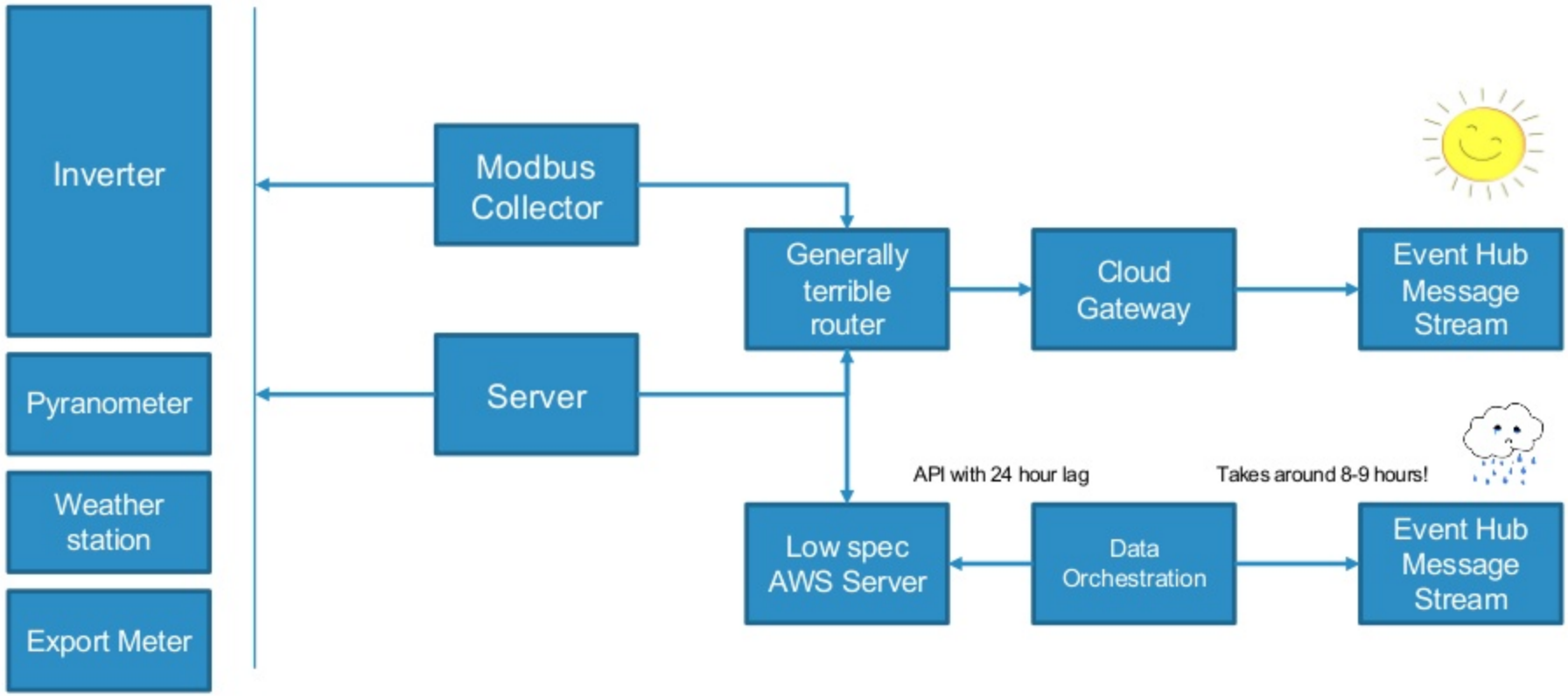


Things to note:

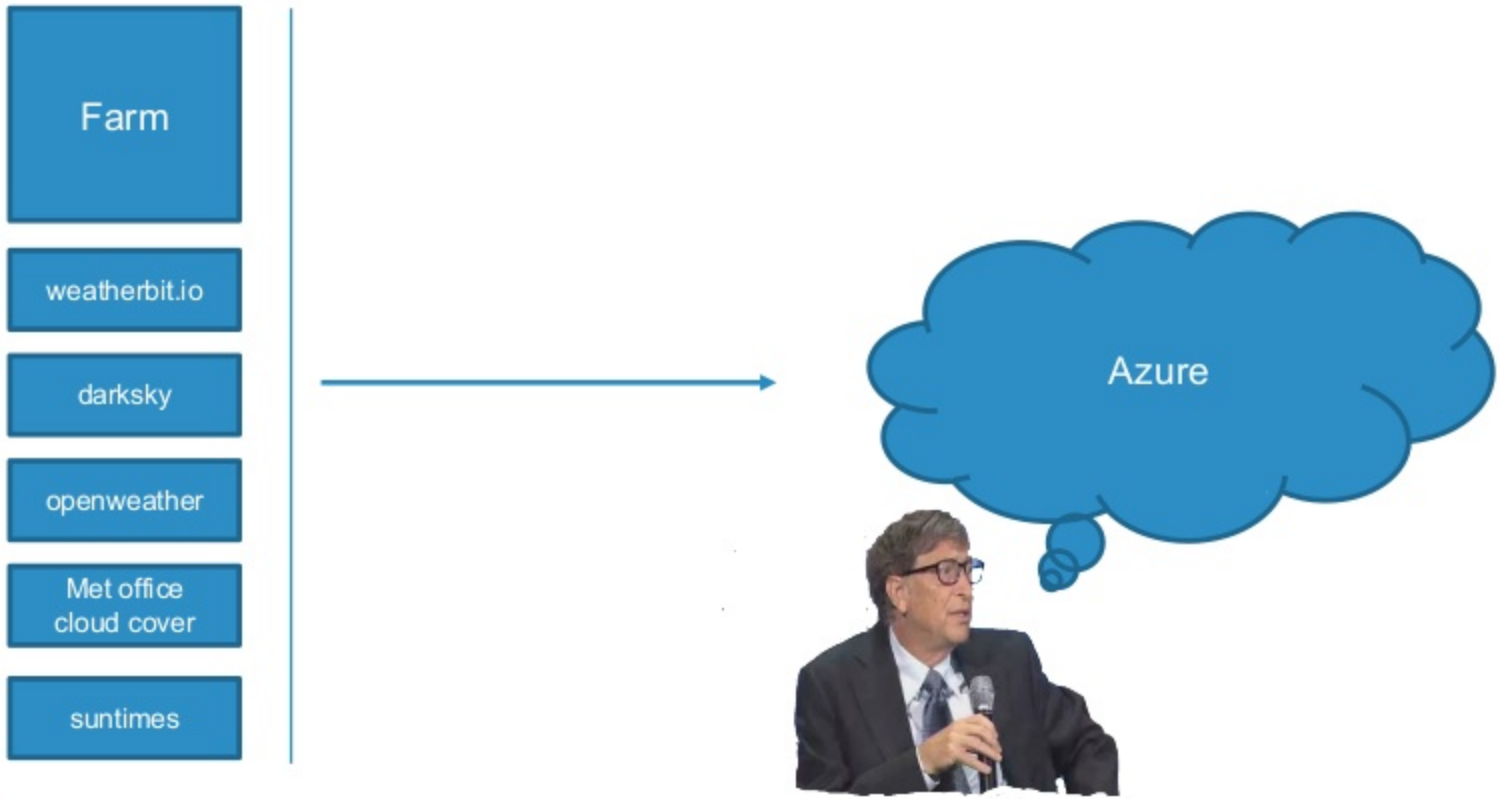
- Inverter can generally only accept a single Modbus TCP connection
- As such usage of Hub and Spoke Models are needed to relay to cloud
- Modbus def example:



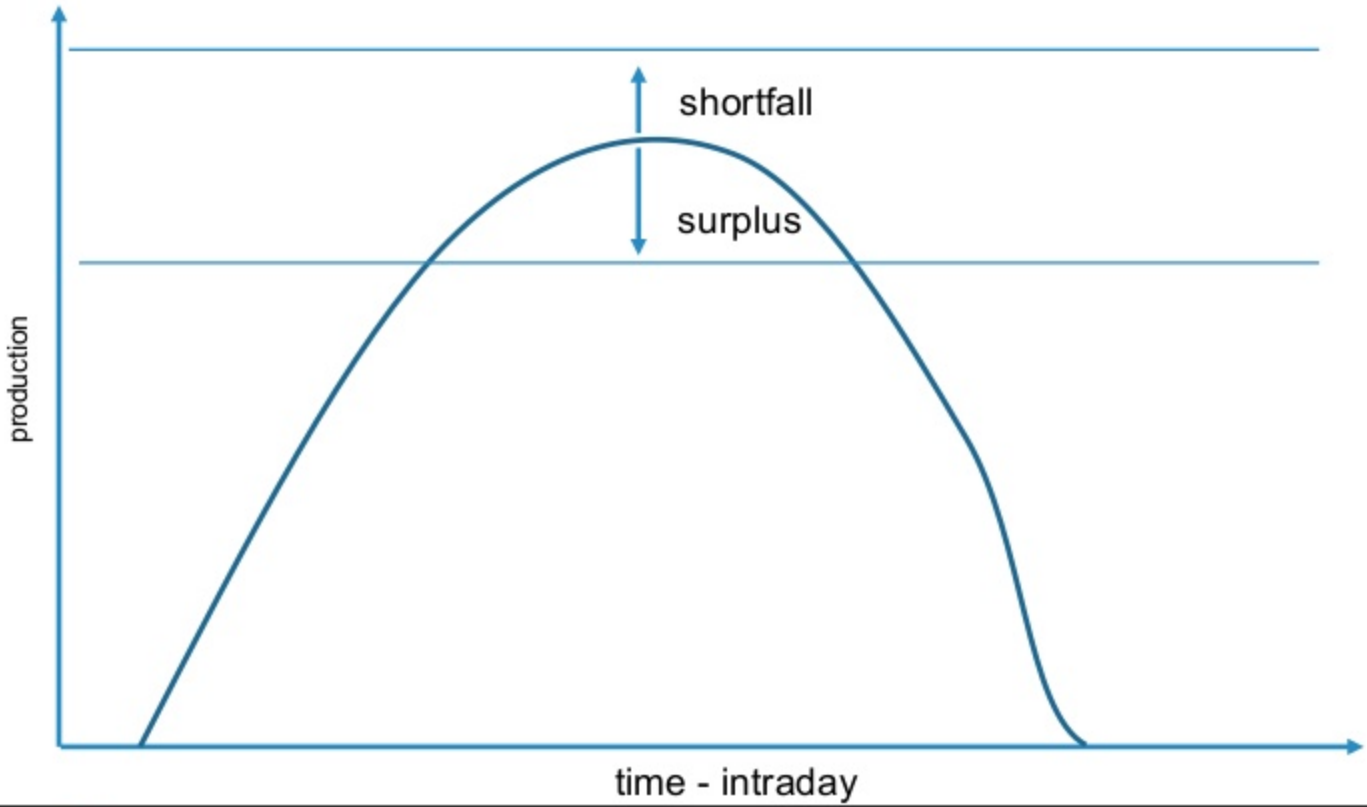
Cloud Gateway Patterns from Farm



All sources of information

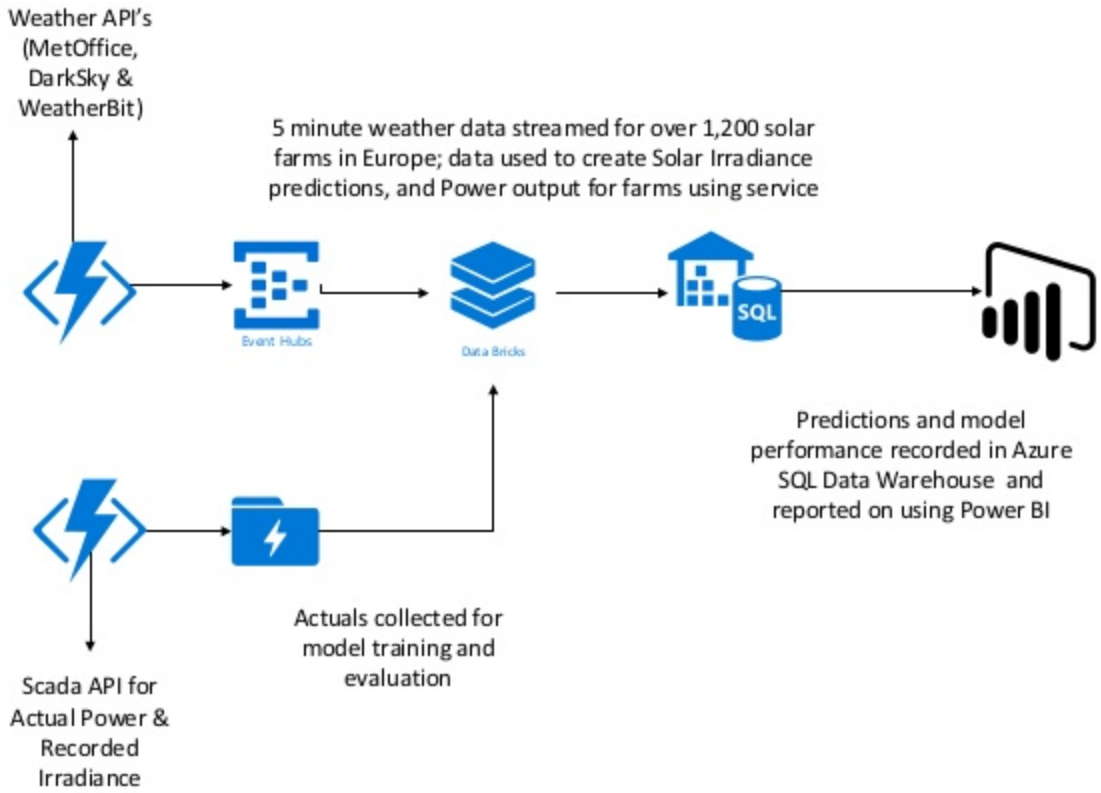


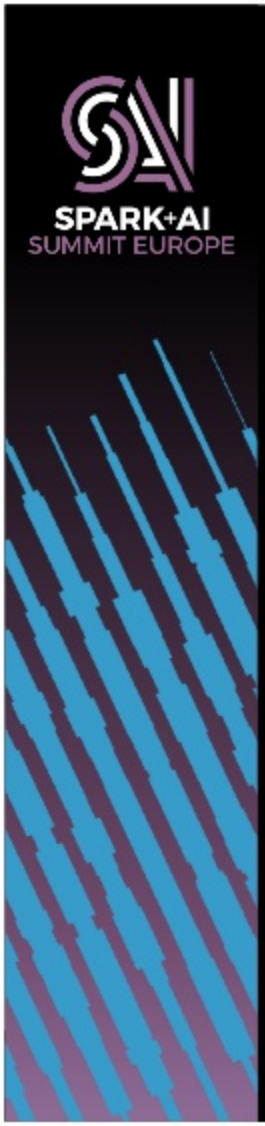
Balancing Energy



- Shortfalls lead to buy back to fulfil contracts
- Surpluses need selling
- Grid needs to be balanced at all times
- Need to understand intraday pricing market to understand exposure
- Insure risk through PPAs for lower returns
- National Grid has balancing cost
- Internal transactions need balancing too
- Need to understand interconnects

Our Azure Architecture





Demos and Code!

Thanks and Questions?