

Making the most of your IoT data:

*Next-generation cloud systems for
trusted, provable service delivery*

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Water RA's Digital, Data & Sensors Webinar Series
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INTERNET OF THINGS

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Topics

- **The IoT landscape in 2020**
- **Why and how is IoT relevant to the Water Industry?**
- **Key considerations for water companies adopting IoT**
- **State-of-the-art example**
- **Future trends**
- **Take-aways**

The IoT global landscape

Enormous connectivity already, and it's only set to keep growing – **rapidly**



Connected
IoT devices,
2020



Global IoT
market,
2020



New IoT devices
connected every
minute

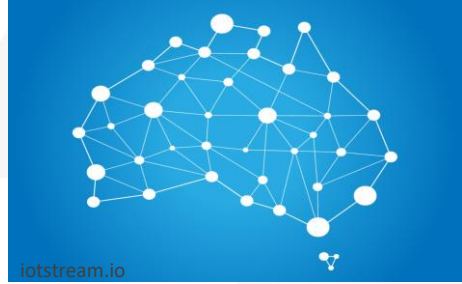


Predicted IoT
devices, 2025

Source: <https://securitytoday.com/>

The Australian landscape

- Rapid growth, set to accelerate with new satellite options & 5G.



Australian
IoT Market,
2018

**\$19 B
AUD**



**\$30 B
AUD**

Estimated
Aus Market,
2023

- Issues remain but are being tackled: especially connectivity.



Why should the water industry care?

Better business intelligence



New solutions



Efficiency improvements



Cost savings



To assist:

Land & Environment



Flood & Drought Management



Water Quality Monitoring



Asset Management



Catchment Area Mapping



Regulation & Compliance



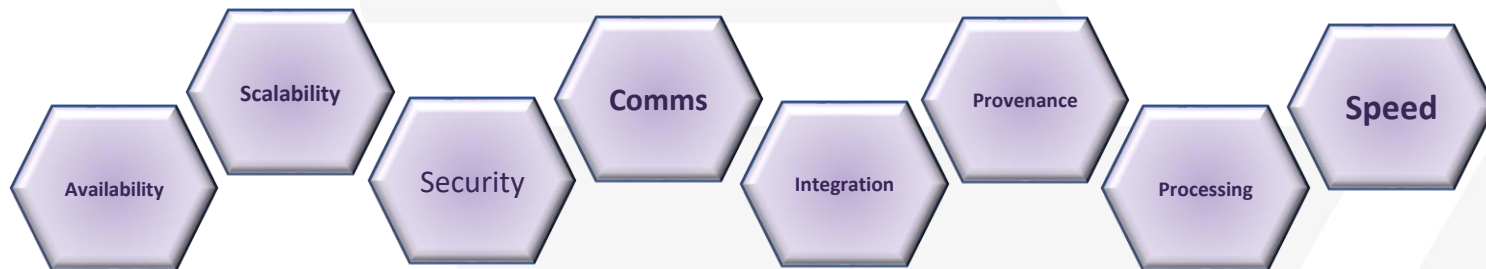
Through IoT sensors such as: water quality, flow rate, temperature, pressure, humidity, gas, level, proximity,

Making the most of your IoT data

Take a systems approach from the outset, including all sensors, other data sources, and your systems



- Careful planning of your IoT system will unlock the benefits promised, but due consideration must be given to key topics, including:



Key considerations

IoT sensors and network

- Sensor and network considerations must be taken together

Key Sensor Considerations
<ul style="list-style-type: none">• Measurements required• Data quality / accuracy• Number & cost• SWAP• Update rate• Reliability & longevity• Operating environment• Communication options• Ease of integration• Lead time & support

Key Network Considerations
<ul style="list-style-type: none">• Range / coverage• Bandwidth• Power usage• Sensor compatibility• Ease of integration• Cost• Maturity• Reliability & resilience• Security• Reusability / sensor agnostic

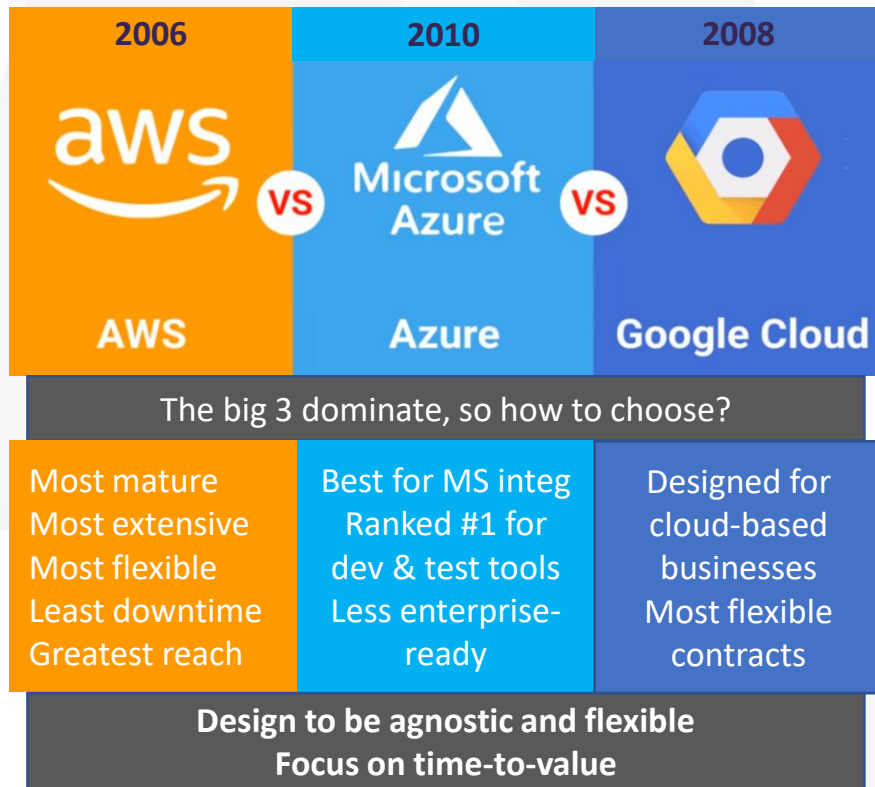
Key considerations

Networks

	Low Power Wide Area Network (LPWAN)	Local Area Network (LAN)	Mobile	Satellite
Range	High	Low	High	High
Bandwidth	Low	High	High	Low
Power usage	Low	Low	High	Low
Examples	LoRaWAN Sigfox	Bluetooth Wifi Zigbee	3G/4G/5G LTE Cat-M1	Myriota Fleetspace Iridium
Applications	Environmental Smart Cities	In-house device management	Remote working	Mining Agriculture

Key considerations

Cloud platform



Key considerations

Data security & provenance

- Introducing IoT devices to existing or new networks brings increased vulnerabilities.
- Important steps for maintaining / enhancing **security** include:
 - Monitoring endpoints
 - Scanning devices for vulnerabilities
 - Segregate the IoT network from the corporate network
- Trust in data, starting from its source right through to usage / display is an increasingly important aspect of any IT system, including those with IoT devices
 - **Data provenance** is the process of tracing and recording the origins of data and its movement between databases, and is an acute issue central to the validation of and trust in data.
 - State-of-the-art solutions are based on **Distributed Ledger Technology** (DLT), synonymous with **Blockchain** is a sub-set (e.g. Hyperledger and Ethereum).

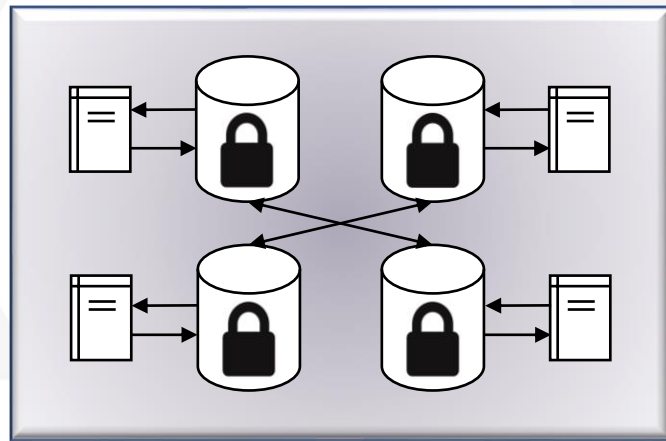


Key considerations

Data provenance through DLT

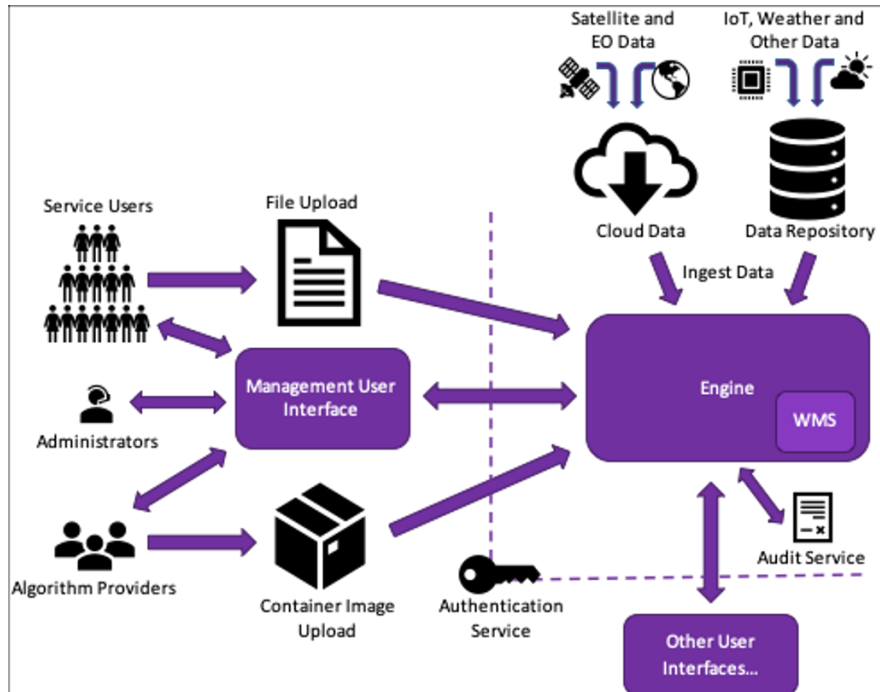
- A distributed ledger is a database that exists across several locations or among multiple participants.
- It is essentially a time-stamped series of immutable records of data that is managed by a cluster of computers not owned by any single entity.
- Each data ledger is secured and bound to each other using cryptographic principles (hashing).
- Ideal for (wrt the water industry):
 - Governance
 - Supply chain auditing
 - IoT - improves cost monitoring
 - Smart contracts

- Decentralisation
- Transparency
- Immutability



State-of-the-art-example

D-CAT's FusionPlatform®

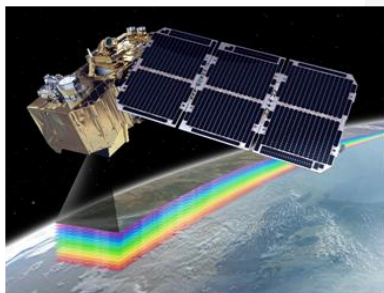


- Flexible, plug-and-play cloud platform for delivering value from sensor data
- Sensor agnostic
- Rapid configuration of algorithm processing chains to meet performance needs and price points
- Secure, and supports DLT
- Fully scalable and built for serving a wide range of industries, including water

IoT fusion example

Using the FusionPlatform[®]

Subsoil moisture mapping @ 10cm

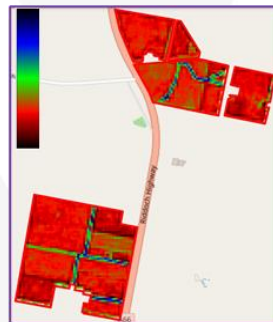


Satellite passes
over area
(~ every 3 days)

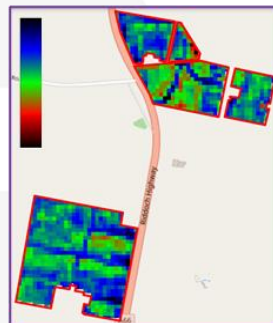


10m resolution
multi-layer image
corrected ready for
processing

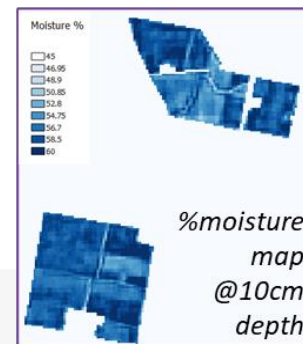
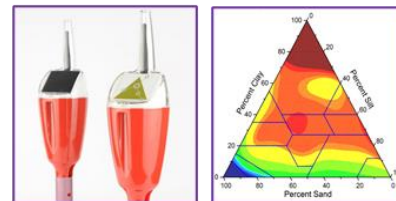
Relative topsoil water &
moisture maps derived



+



% Moisture readings from
probe at 10cm depth
every 30 mins & soil info.



Resulting System Output



Trends & take-aways

- Some trends to watch:



Improved
connectivity



Inbuilt data
provenance



Digital
twinning

- This is a rapidly moving space: sensors, cloud, comms, security/provenance
 1. Plan your IoT adoption carefully to reap maximum benefits and avoid pitfalls
 2. Build on solid infrastructure that scales and is future-proofed
 3. Services must be easy to consume and reconfigure, and delivering business value