To the Cloud and Back Again

Econais / Xively / Econais

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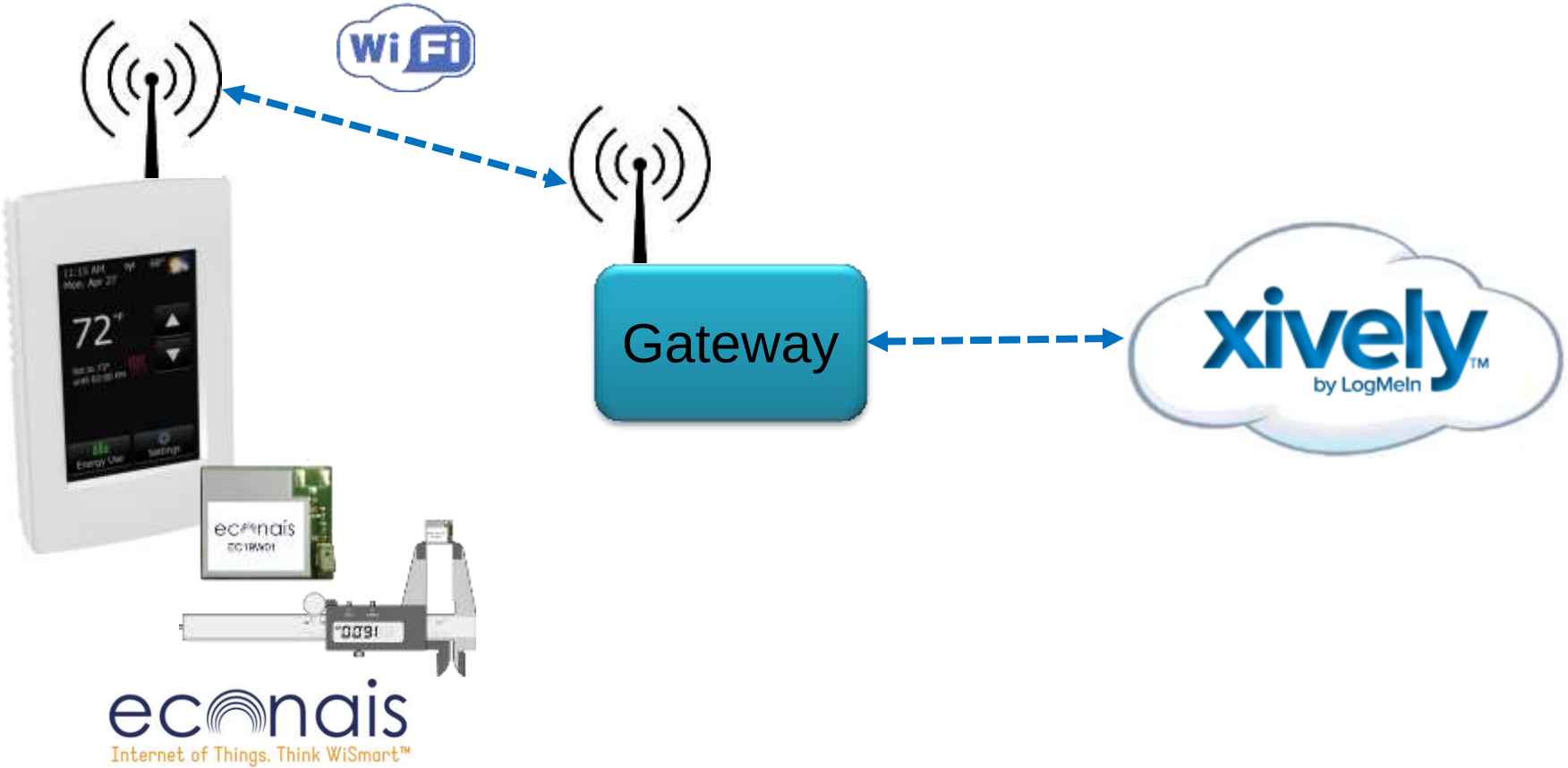
Econais

Connect devices to the cloud! What does it really take?



Econais & Xively: Roles in Cloud Connected Devices

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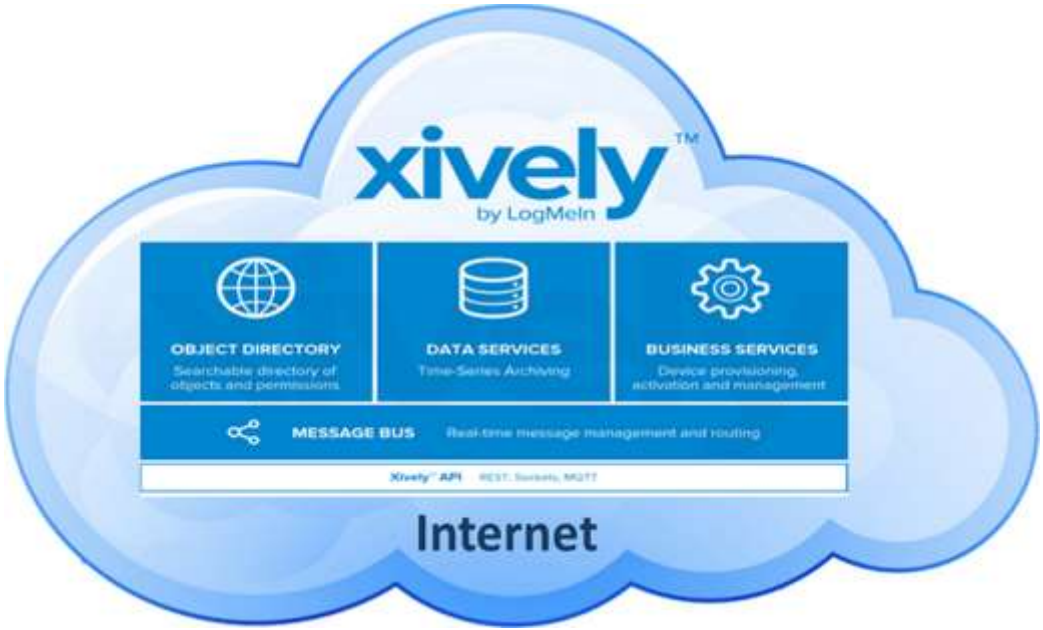
Gather and prepare data
Manage Wi-Fi connection
Handle cloud connection
Exchange data with cloud
Act on data from cloud



Getting Started …

Add wireless cloud support to a device with Wi-Fi

Wiring-in WiSmart™ to Put a Device in the Cloud

CDS Cell
Resistive Light Sensor

UV Detector

Magnetic Reed Switch

Gyro

Analog

Digital

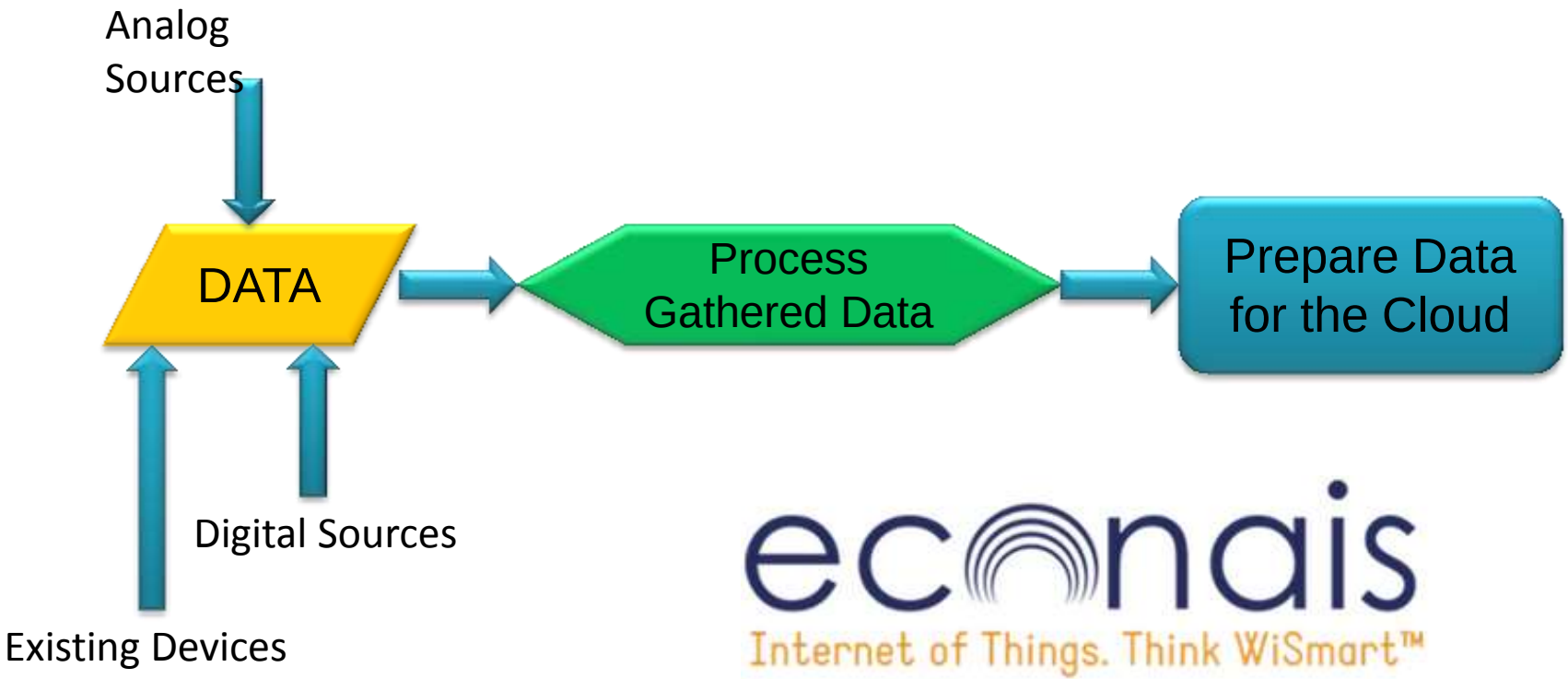
Coding the Calls to Wi-Fi

```
/* create the xively library context */
xi_context_t* xi_context = xi_create_context(XI_HTTP, API_KEY, FEED_ID );

/* remember the count for pairs */
size_t pairs_count = NUM_OF_DATASTREAMS;

/* create feed */
xi_feed_t f;
memset( &f, 0, sizeof( xi_feed_t ) );

/* set datastream count */
f.feed_id = FEED_ID;
f.datastream_count = pairs_count;
```

Coding the Calls to Wi-Fi (cont'd)

```
/* for each pair */
   for( i = 0; i < pairs_count; i++ )    {
      /* get the datastream pointer */
      xi_datastream_t* d = &f.datastreams[ i ];
      /* set the datapoint count */
      d->datapoint_count   = 1;
      int size = sizeof( d->datastream_id );
      int s = xi_str_copy_until( d->datastream_id, size, datastream_ids[i], '\0' );
      /* get the datapoint counter */
      xi_datapoint_t* p = &d->datapoints[ 0 ];
      /* set the datapoint - send random value */
      xi_set_value_i32( p, DATASTREAM_VAL);
   }
   xi_feed_update(xi_context, &f );
```

Gathering Data from Device to Provide to Cloud



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Connecting to the Cloud and exchange data

Connect to Xively™ cloud using any of the available protocols

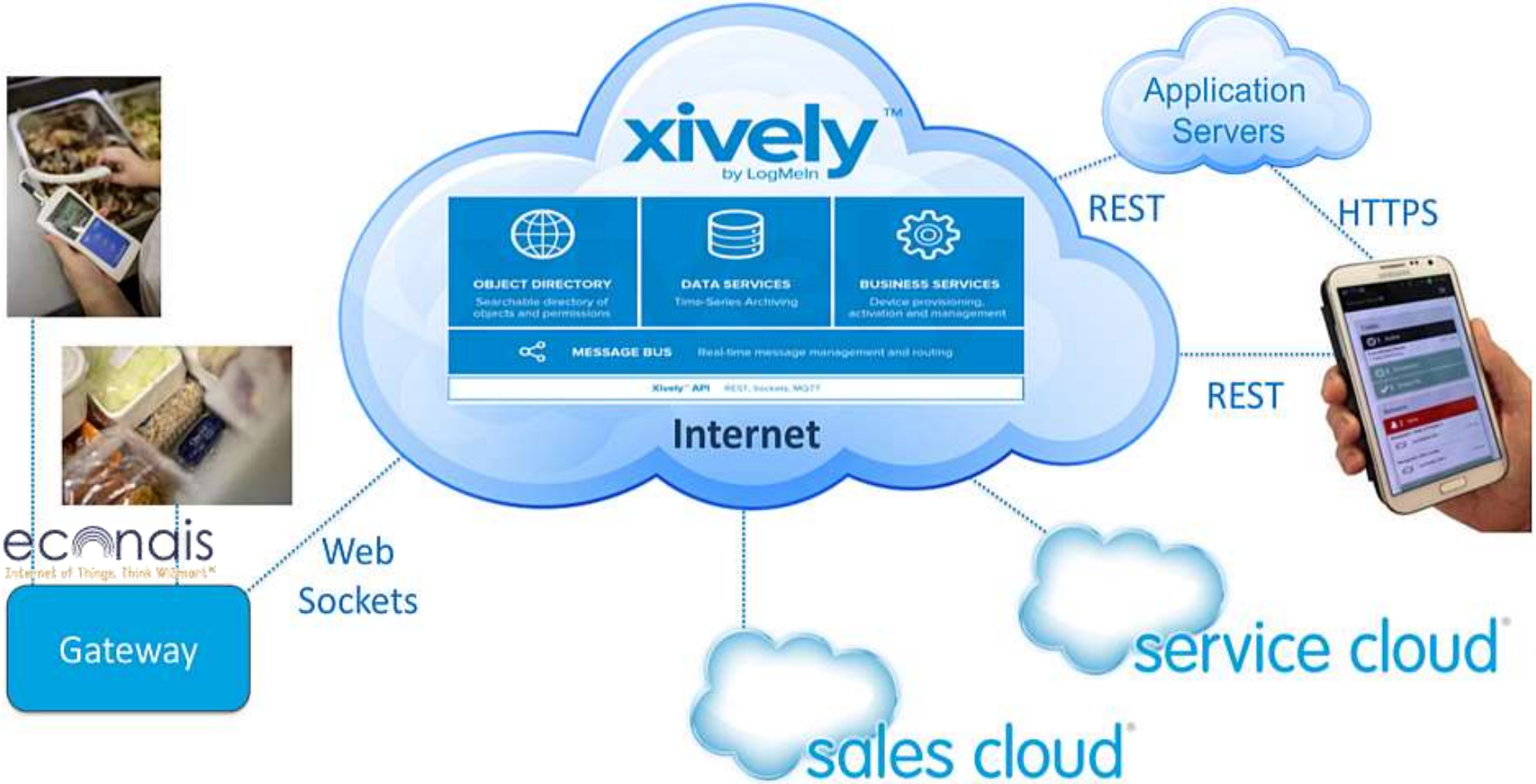
Write the prepared data to the corresponding feeds

Read back from cloud data for the device

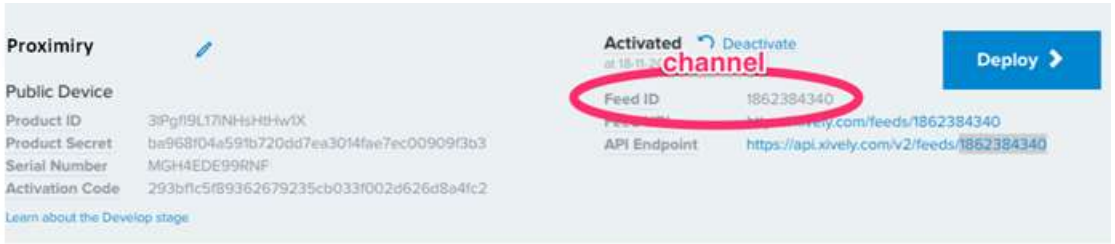
Perform the action corresponding to the fetched data

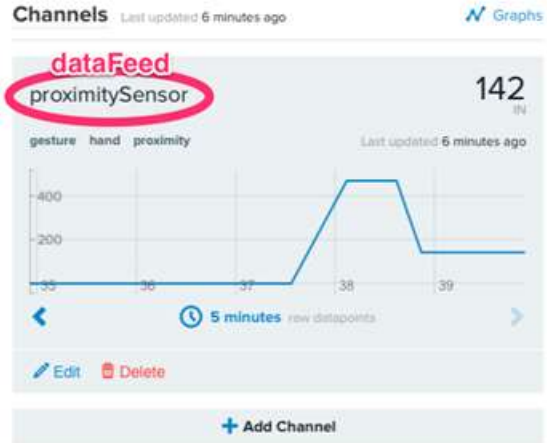
- REST
- HTTPs/HTTP
- Websockets
- MQTT

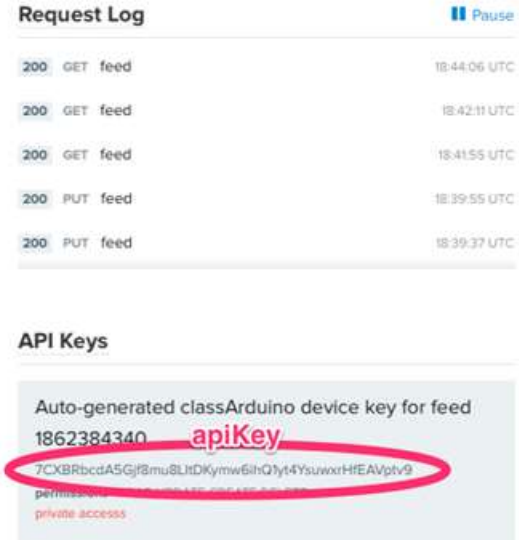
Data in the Cloud – What is Possible?



Data in the Cloud – What is Possible? (cont'd)



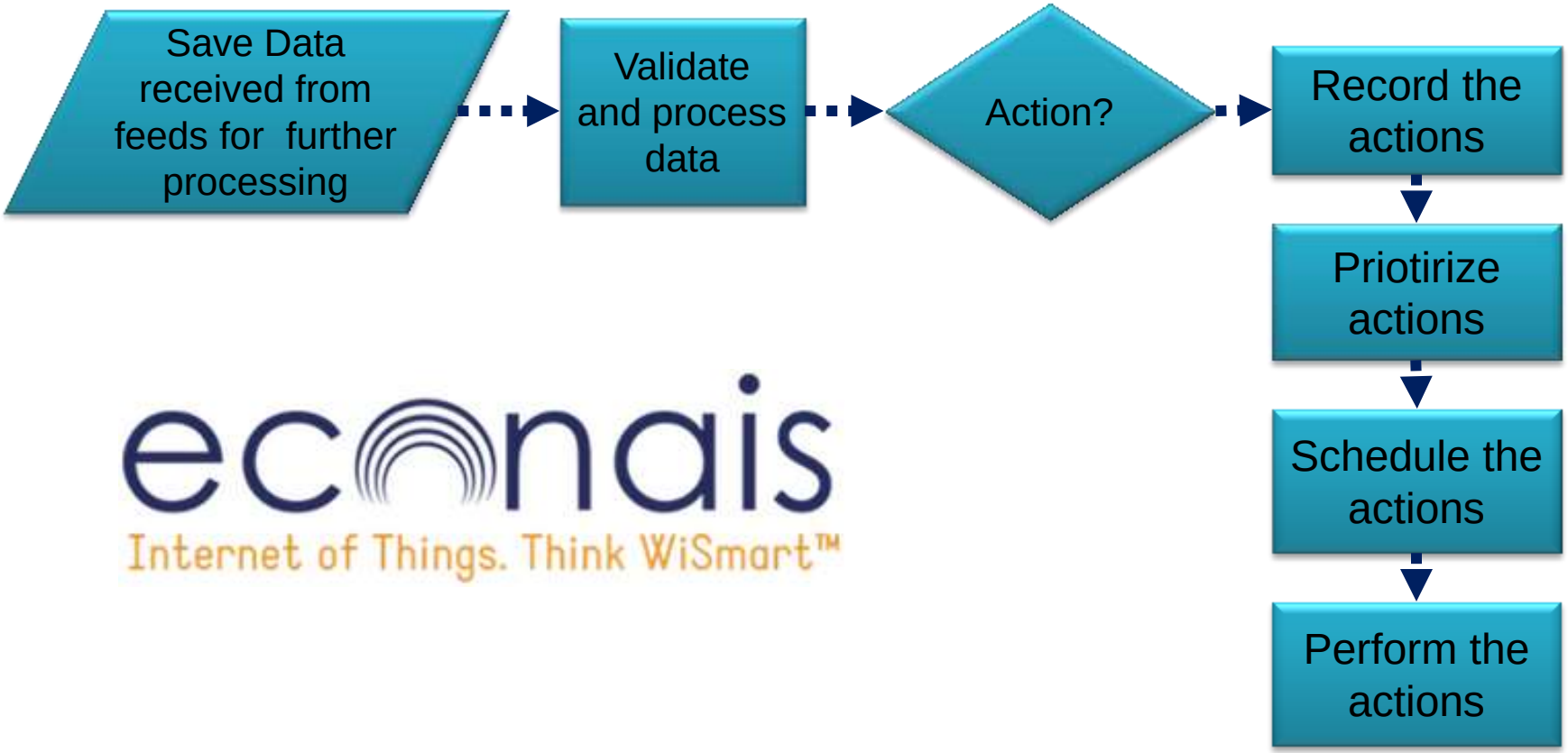




Data from Cloud -> Update & Control Devices

- Data from the Cloud can be used by the Device
  - to update local values
  - to perform control tasks for the device itself
  - to control other connected devices
  - to trigger actions
  - to start procedures for gathering more data
- Same Protocols
- Unified Treatment

Acting on Data from the Cloud



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Cautionary Tales - Do's/Don'ts

Do's

- Carefully plan the communication with the cloud to avoid excessive data transfers
- Use separated Read/Write paths for the feeds
- Pre-process data in WiSmart™

Don'ts

- Do not oversample
- Avoid blocking calls in the code used in WiSmart™
- Avoid processing of data while receiving them
- Avoid processing data while sending them

Best Practices and Tips and Tricks

- Group the data feeds in priorities and set the update intervals by priority
- Take advantage of the Xively™ platform to create the cloud applications and the remote mobile apps
- Take advantage of the WiSmart™ processing power to “clear” the data and avoid unnecessary data exchange
- Prefer HTTPs/HTTP for devices behind firewalls

Summary/Review

- Xively™ and Econais offer an easy, comprehensive and complete cloud solution
- HTTPs/HTTP/REST/WebSockets and MQTT support
- Econais WiSmart™ modules provide the easiest way to cloud-enable any device or sensor with a few lines of simple code added in WiSmart™, without any need for additional MCUs
- Easy to monitor and control large scale applications

Thank You on Behalf of Xively & Econais

Coding the Calls FROM Wi-Fi

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Nikos – Code Here for Data FROM Cloud? Example?