

To the Cloud and Back Again

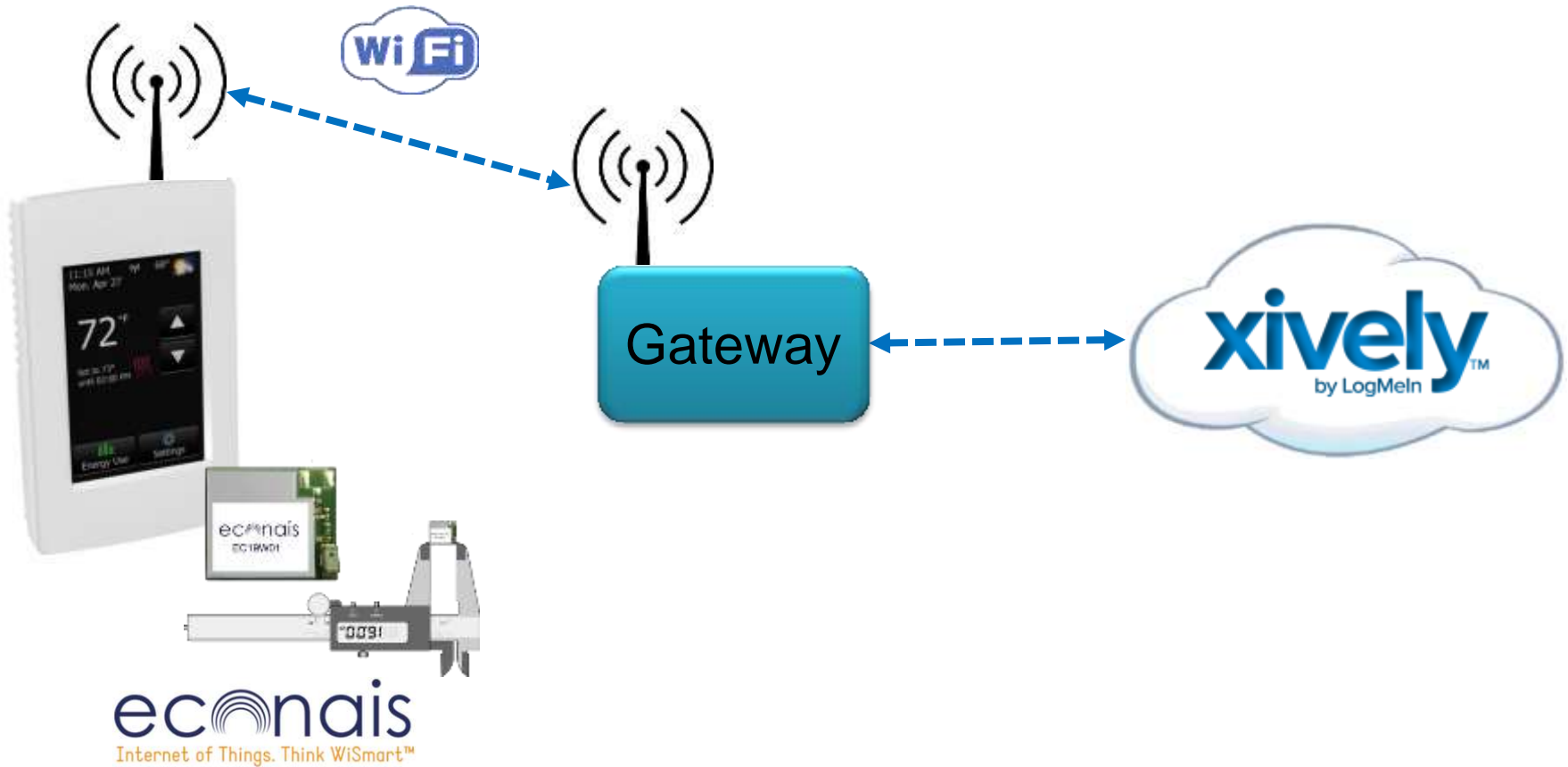
Econais / Xively / Econais

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Econais

xivelyTM
by LogMeIn

econais
Internet of Things. Think WiSmartTM

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



Econais & Xively: Roles in Cloud Connected Devices



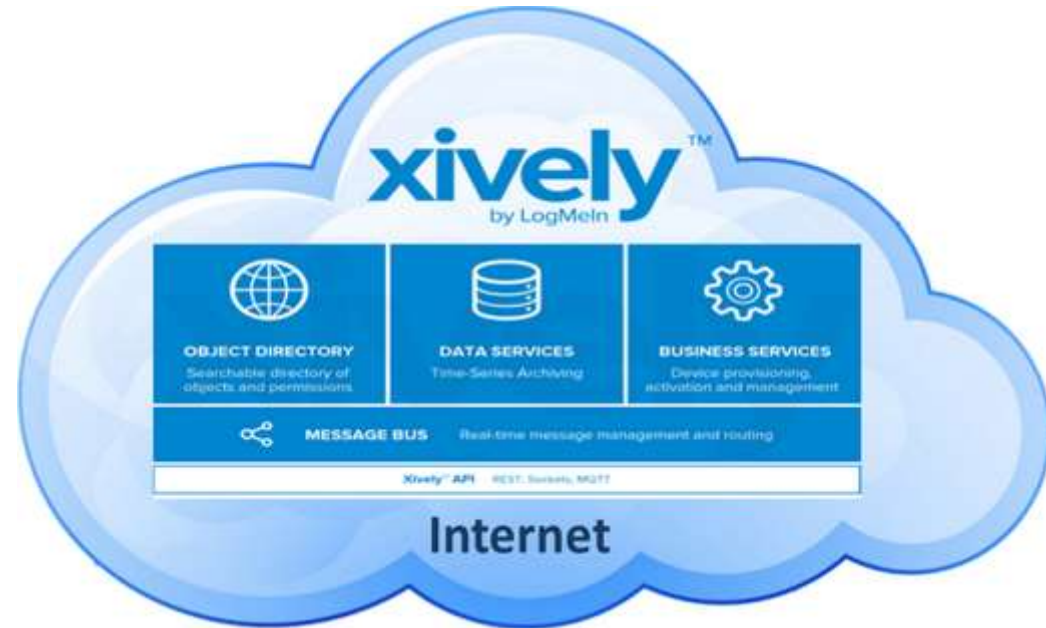
Gather and prepare data

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



Gyro



Magnetic Reed Switch

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 */
```

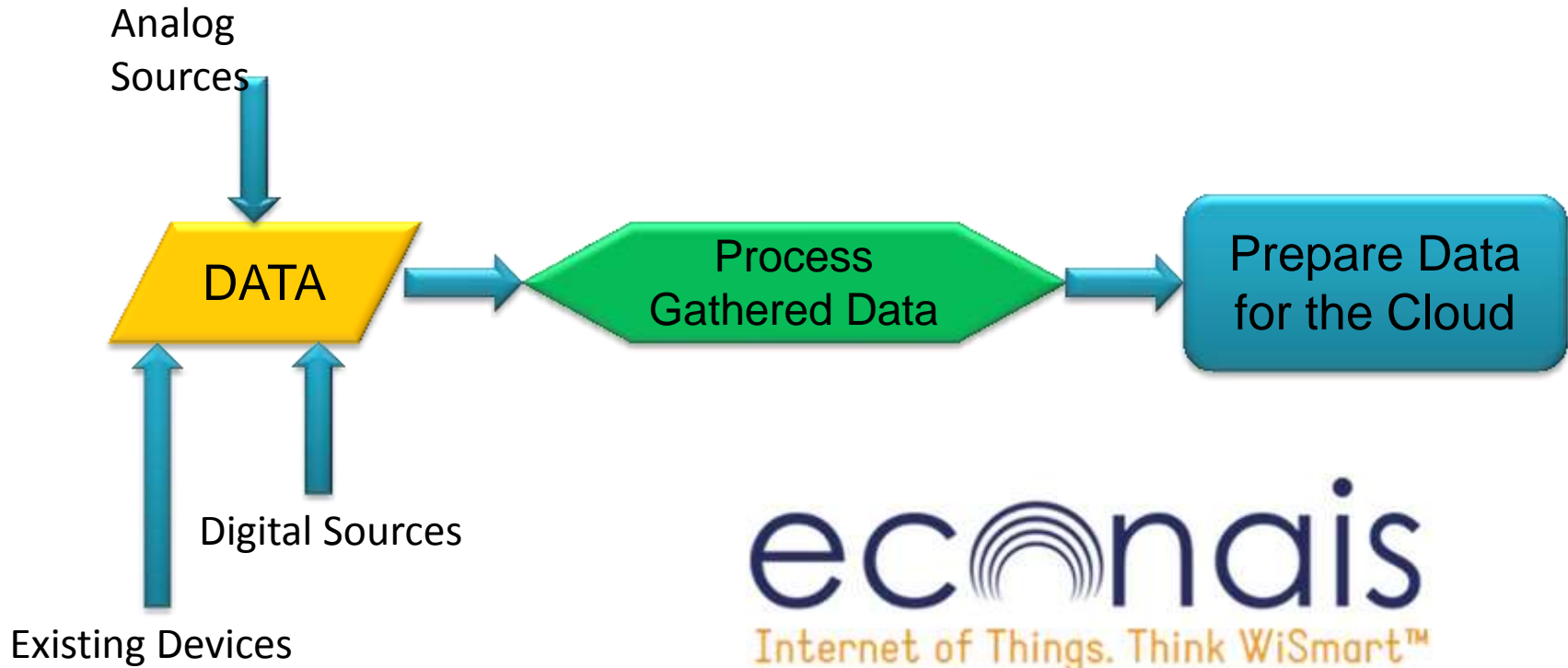
```
f.feed_id = FEED_ID;
```

```
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_untiln( 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



- REST
- HTTPs/HTTP
- Websockets
- MQTT

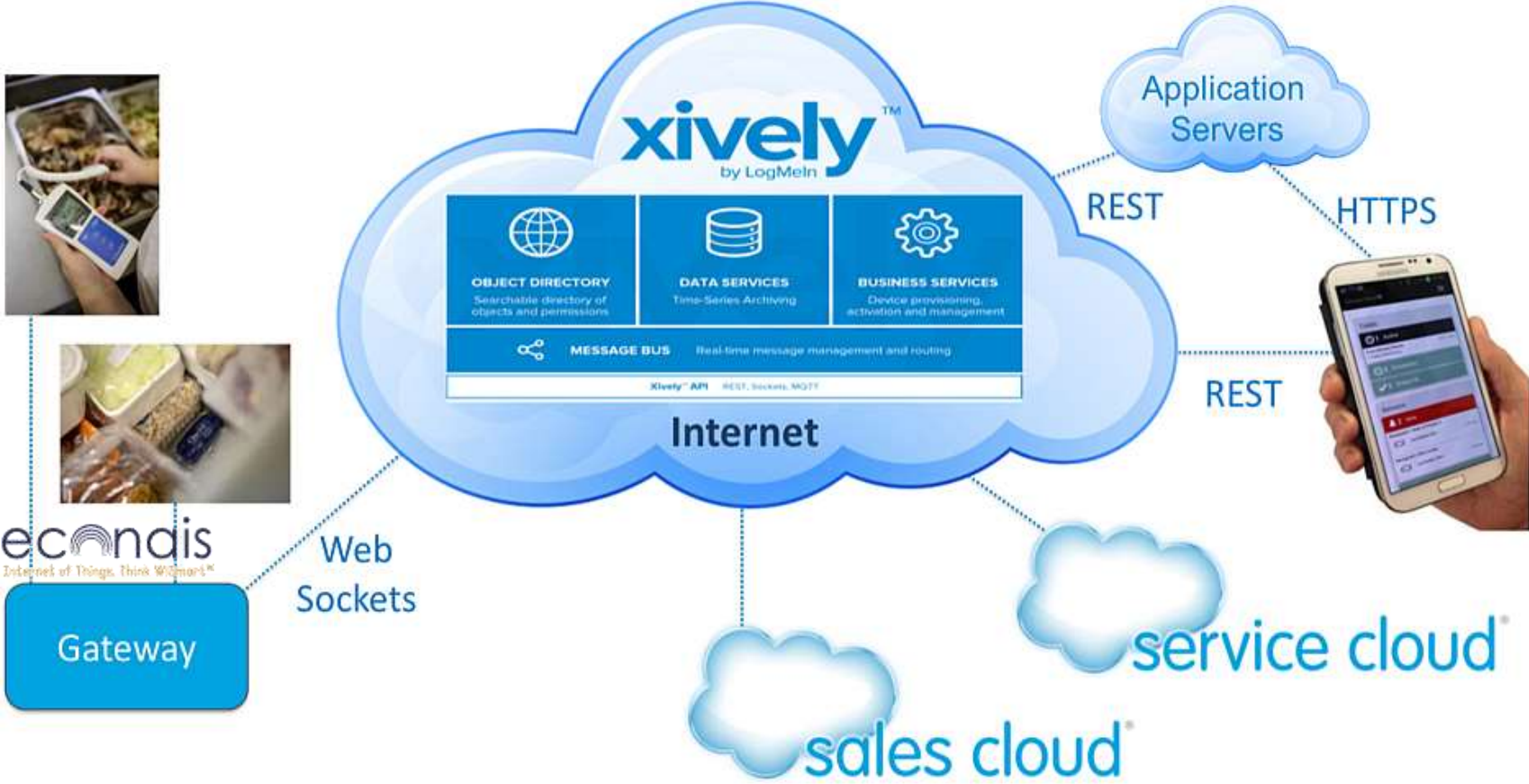
Perform the action corresponding to the fetched data




Read back from cloud data for the device



Data in the Cloud – What is Possible?



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


Proximiry 

Public Device


Product ID 3fPg19L17iNHsHh-hw1X
Product Secret ba968f04a591b720dd7ea3014fae7ec00909f3b3
Serial Number MGH4EDE99RNF
Activation Code 293bffc5f89362679235cb033f002d626d8a4fc2

[Learn about the Develop stage](#)

Activated  Deactivate
channel


Deploy 

Feed ID 1862384340
API Endpoint <https://api.xively.com/v2/feeds/1862384340>



Channels Last updated: 6 minutes ago 


dataFeed
proximitySensor 142 IN


gesture hand proximity Last updated: 6 minutes ago



5 minutes raw datapoints

  Delete

 Add Channel

Request Log 

200	GET	feed	18:44:06 UTC
200	GET	feed	18:42:11 UTC
200	GET	feed	18:41:55 UTC
200	PUT	feed	18:39:55 UTC
200	PUT	feed	18:39:37 UTC

API Keys

Auto-generated classArduino device key for feed 1862384340 **apiKey**

7CXBRbcdA5Gj8mu8LHDKymw6ihQ7yM4YsuwxrHFEAVptv9
permissions: [view feed](#), [update feed](#), [delete feed](#), [private access](#)

Channels Last updated: 2 minutes ago

AirPressure 983.623 hPa



AmbientLight 3.5 lux



Humidity 45.3 %



Temperature 25.56 °C

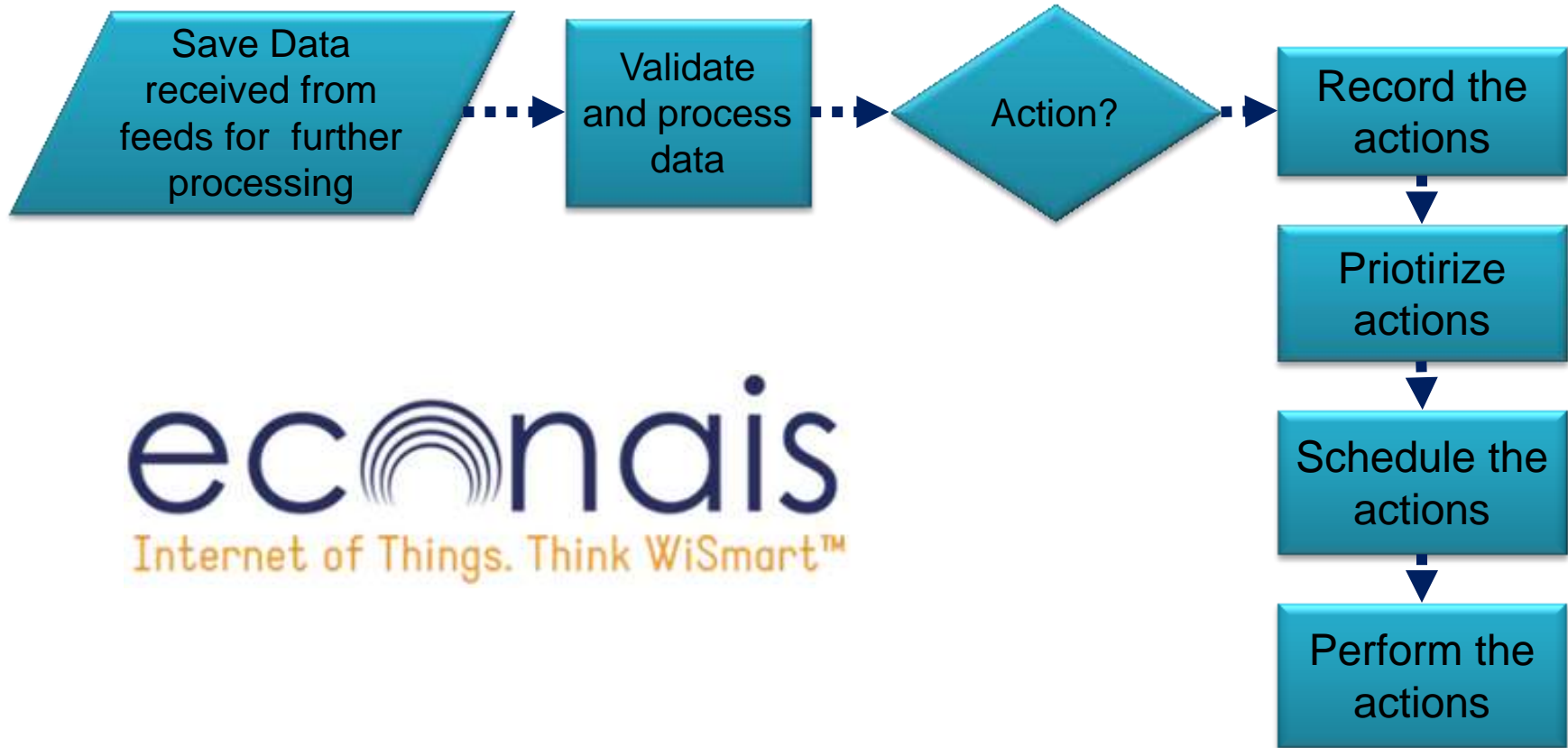


Location

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

Nikos – Code Here for Data
FROM Cloud? Example?