

# MagentaZuhause App and Web Of Things

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LIFE IS FOR SHARING.



MagentaZuhause  
Haushaltmanager

MagentaZuhause  
TV App

MagentaZuhause  
App

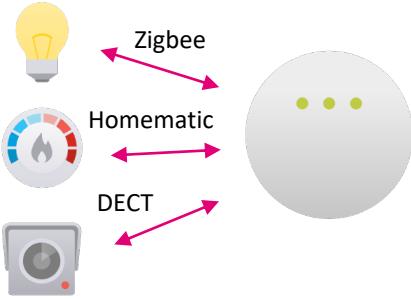
Hallo Magenta &  
Amazon Alexa

MagentaZuhause  
App Cloud

Router &  
Smart Home

IoT device  
vendors

LXC Container based  
on Eclipse Smart  
Home



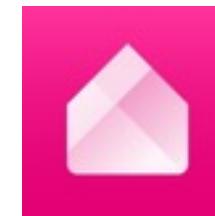
WoT-inspired  
protocol

MQTT/Kafka

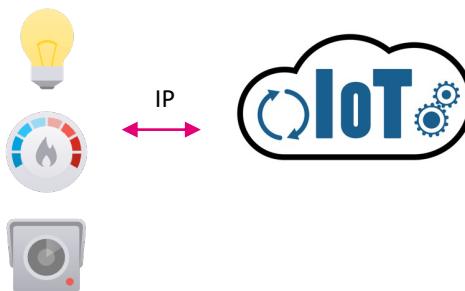


GraphQL API

HTTP/WebSocket



MagentaZuhauseApp Cloud  
Rule Engine +  
Digital Twin +  
Cloud Connectors



Proprietary  
protocols

# MagentaZuhause App

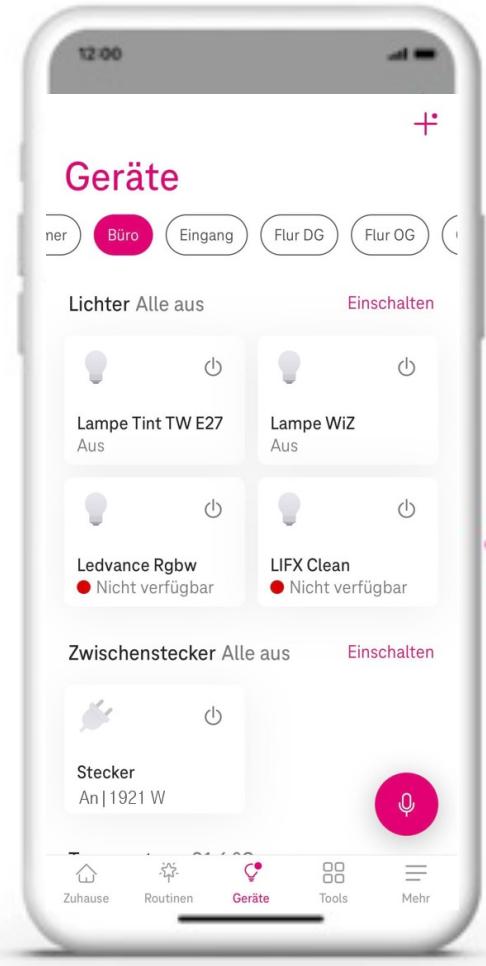
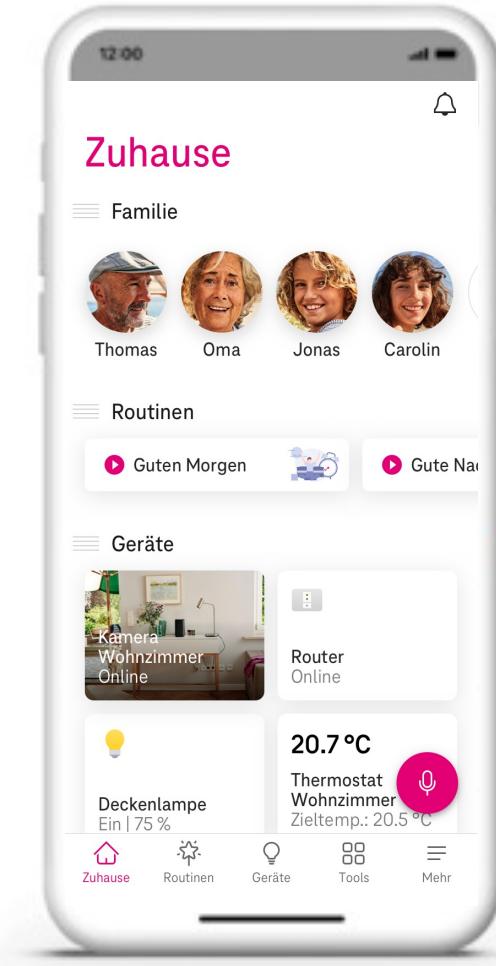
We help you create a connected home that takes care of the people and things inside.



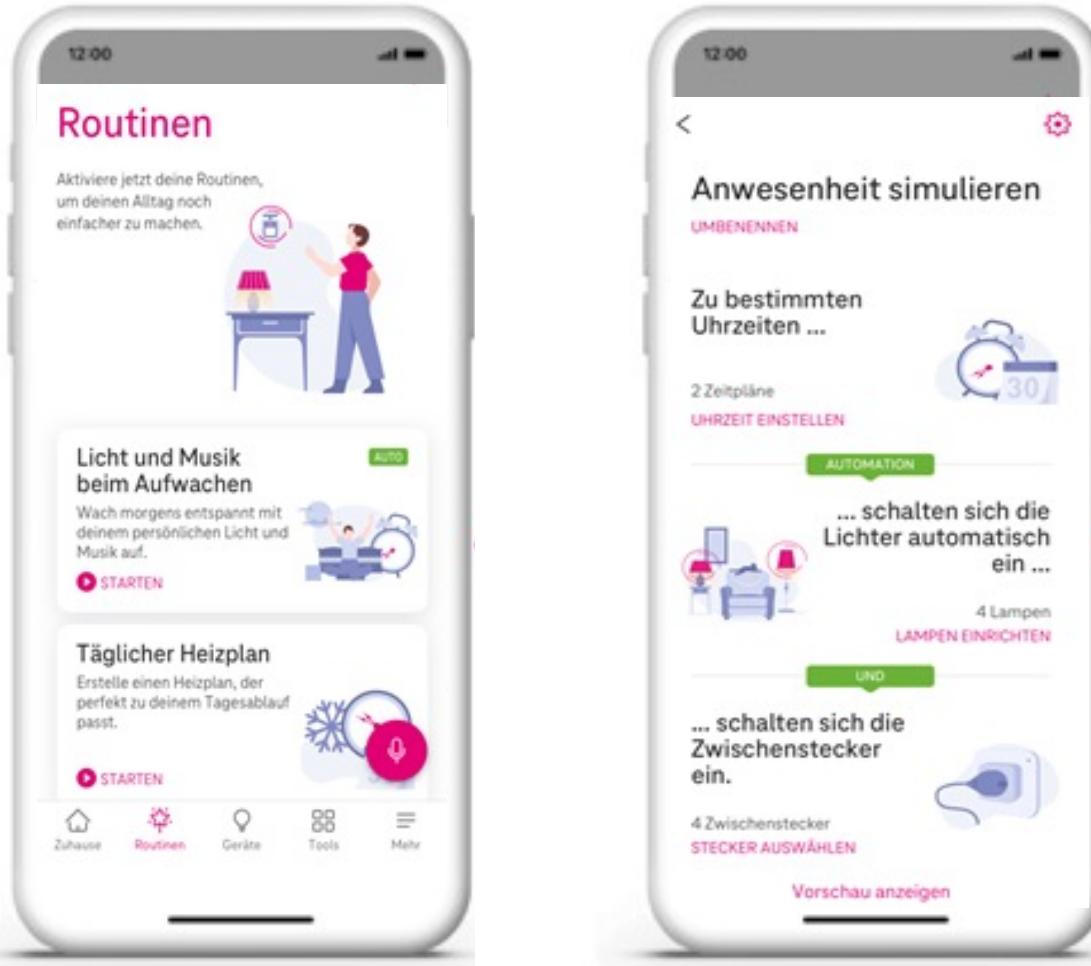
Good & safe family life  
Take care of your loved ones and manage everyday family coordination with ease.



Smarter home  
Gain security and comfort for your home.

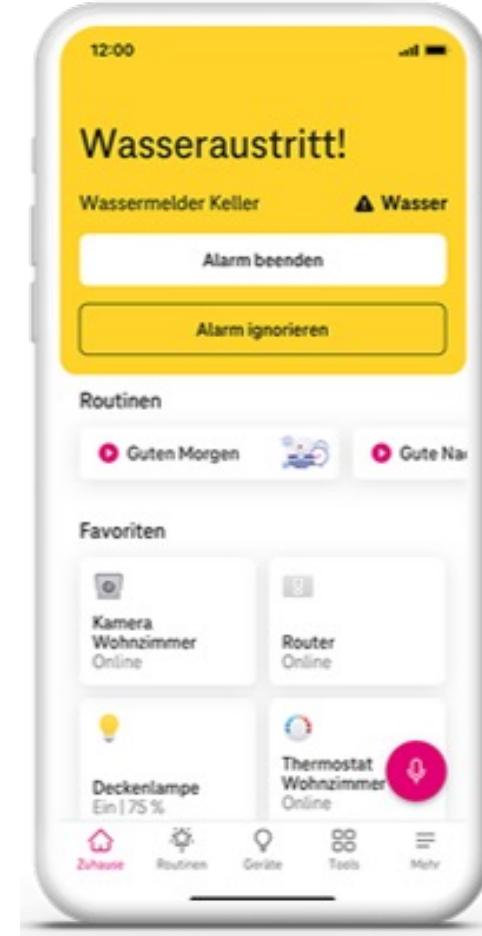
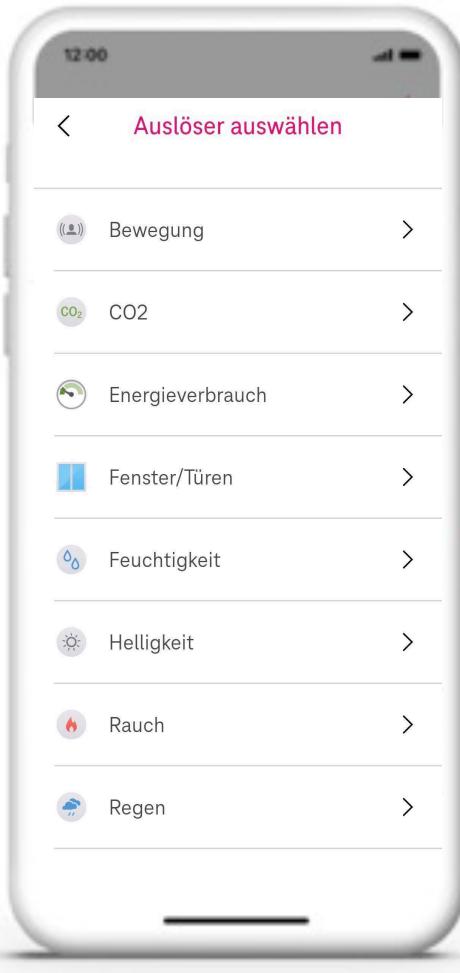
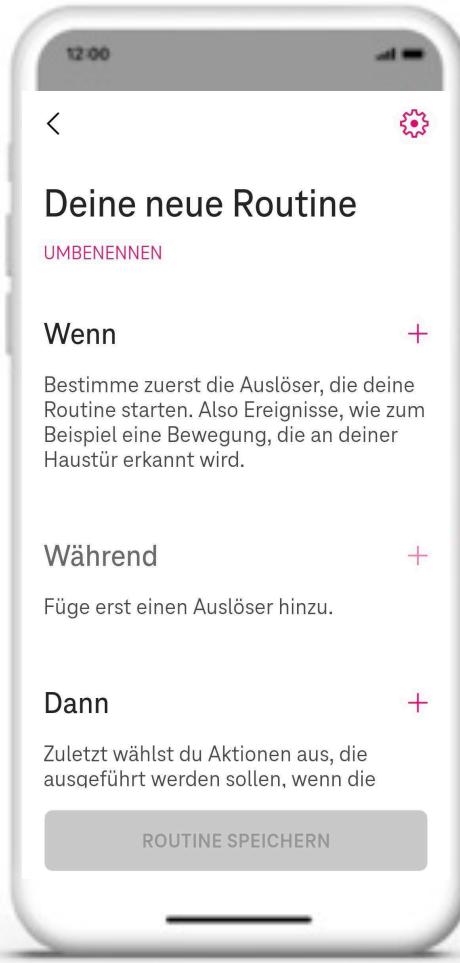


# MagentaZuhause App – Routine templates



- Trigger
  - Time-based (cron)
  - Sunrise / Sunset
  - Thing Property Changes
  - Thing Events
- Conditions (and/or)
  - Thing Property Conditions
  - Date Time Conditions
- Actions
  - Change Thing properties
  - Invoke Thing Actions
  - Enable/Disable rules
  - Lock/unlock Things
  - Save/restore Thing properties

# MagentaZuhause App – Custom routines

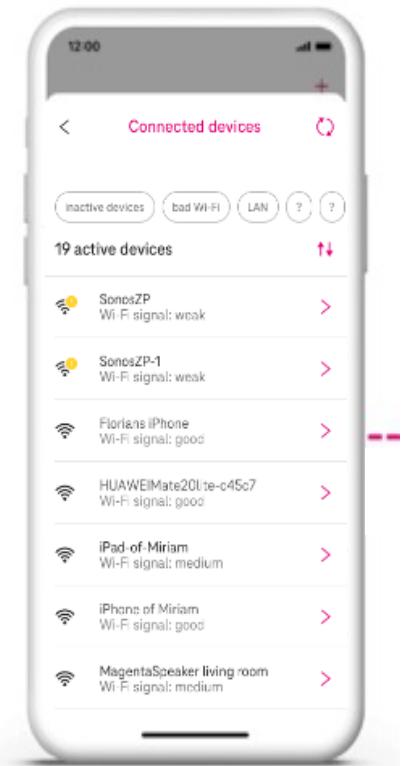
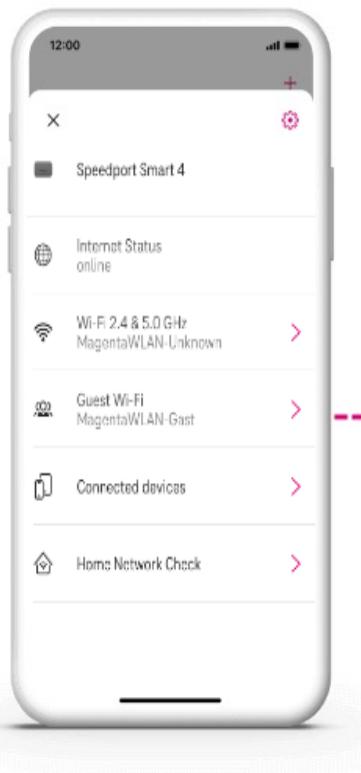


# MagentaZuhause App



Worry-free WiFi

Easy home network management for everyone  
in your household.



# MagentaZuhause App



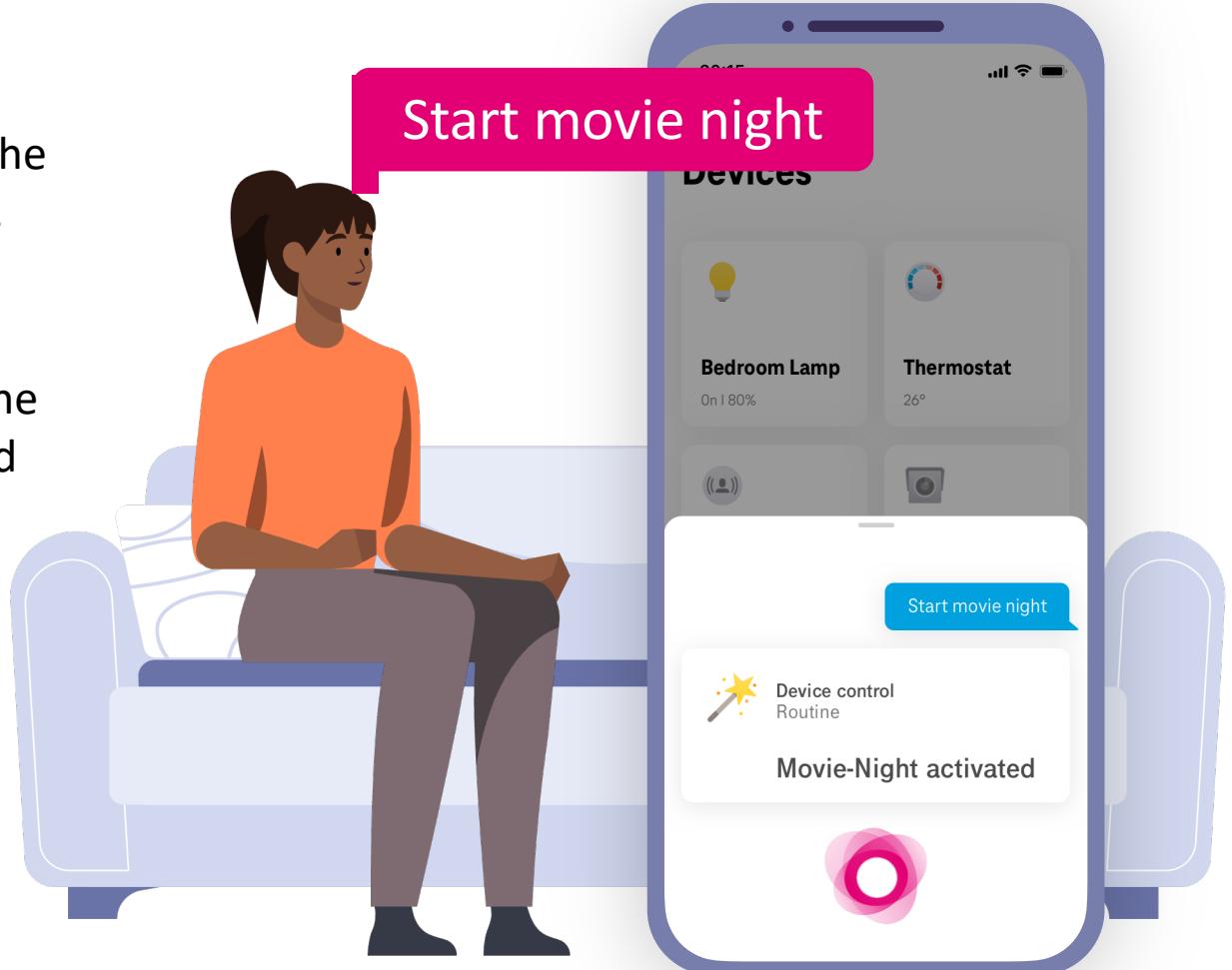
## Integrated seamlessly

Magenta Voice Assistant applies to the whole MagentaZuhause Eco System.

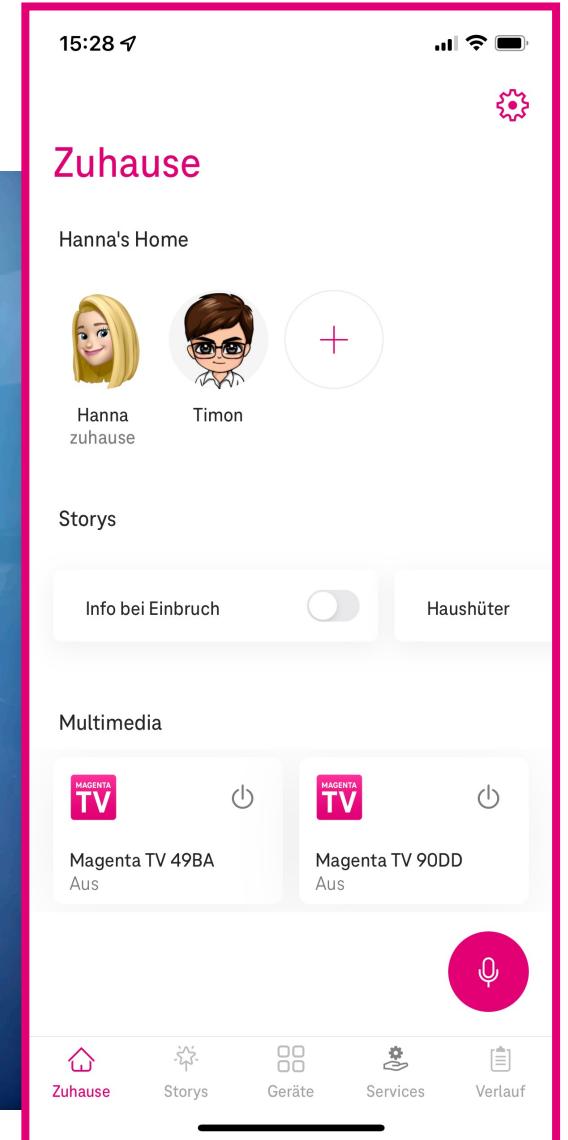
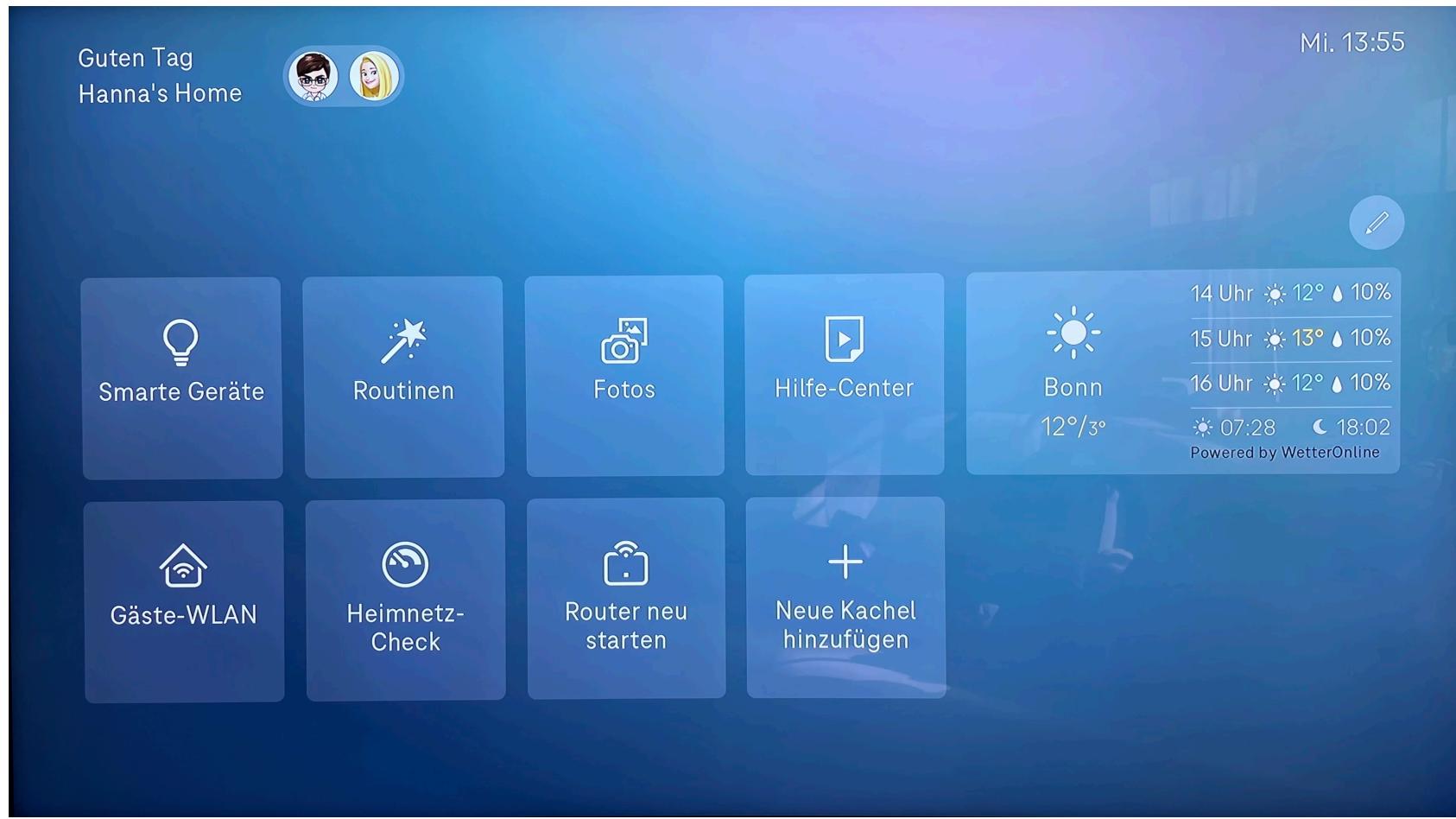


## Natural interaction

Magenta Voice Assistant remedies the need for complex user interfaces and complex navigation.



# MagentaZuhause TV & Mobile App





# WoT Data Model

- A W3C Web of Things (WoT) Thing Description inspired data model is used to describe Things in a machine-readable format.
- A Thing is an abstraction of a physical device, virtual device or web service
  - A Thing has a state (in form of properties)
  - A Thing has functions (actions) which can be executed to change the state
  - A Thing can emit events, e.g., MotionDetected, BatteryLow, ButtonPressed
  - A Thing has meta data, e.g., vendor, brand, model, serial number.
- **Thing purposes:** A Thing can have multiple purposes: Lighting, MotionDetection, AmbientLightSensing
- **Thing category:** A Thing belongs to one category, e.g. LightBulb, ColorLightBulb, ContactSensor, Camera, Plug ...

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# WoT Data Model

The screenshot shows the MagentaZuhause App interface with the WoT Data Model section open. The left sidebar lists various WoT concepts and models. The main area displays two JSON objects: one for 'Temperature' and one for 'TargetTemperature'.

**Temperature**

```
{
  "properties": {
    "temperature": {
      "propertyType": "TemperatureProperty",
      "title": "Temperature",
      "type": "number",
      "readOnly": true,
      "unit": "°C",
      "description": "The current measured temperature."
    }
  }
}
```

**TargetTemperature**

```
{
  "properties": {
    "targetTemperature": {
      "propertyType": "TargetTemperatureProperty",
      "title": "Target temperature",
      "type": "number",
      "unit": "°C",
      "description": "The target temperature that should engage a thermostats heating and cooling actions.",
      "minimum": 5,
      "maximum": 30,
      "step": 0.5
    }
  }
}
```

The right sidebar lists various sensor types and other WoT concepts:

- Running
- Sensor
- AmbientLight
- BarometricPressure
- CarbonDioxide
- OpenClosed
- CarbonMonoxide
- CarbonMonoxideLevel
- DisplayRotation
- GustDirection
- GustSpeed
- Humidity
- Illuminance
- Keylock
- Noise
- Rainfall
- RainfallWithinLastHour
- RainfallWithinLast24Hours
- SoilMoisture
- SoilTemperature
- Temperature
- TargetTemperature
- WindDirection
- WindSpeed
- Siren
- ActiveSiren
- Storage

# WoT Data Model

## Change Thing Properties Commands

```
{  
  "messageType": "ChangeThingPropertiesCommand",  
  "id": "99cc08b3-23c4-4656-aa72-b15e45f47e96",  
  "timestamp": "2019-12-06T08:29:32.431Z",  
  "homeId": "homeId",  
  "thingId": "dect:sercomm_outdoorPlug_v1:0001",  
  "properties": {  
    "on": {  
      "propertyType": "OnOffProperty",  
      "type": "boolean",  
      "value": true  
    }  
  },  
},
```

## Thing Properties Updated Events

```
{  
  "messageType": "ThingPropertiesUpdatedEvent",  
  "id": "99cc08b3-23c4-4656-aa72-b15e45f47e96",  
  "timestamp": "2019-12-06T08:29:32.431Z",  
  "version": "1.0",  
  "homeId": "homeId",  
  "thingId": "dect:sercomm_outdoorPlug_v1:0001",  
  "properties": {  
    "on": {  
      "propertyType": "OnOffProperty",  
      "type": "boolean",  
      "value": true  
    }  
  }  
}
```

# WoT Data Model

## Invoke Thing Actions Commands

```
{  
  "version": "1.0",  
  "id": "99cc08b3-23c4-4656-aa72-b15e45f47e96",  
  "homeId": "homeId",  
  "thingId": "sonos:householdId@RINCON_B8E937E504B201400:1083008967",  
  "timestamp": "2019-12-06T08:29:32.431Z",  
  "messageType": "InvokeThingActionCommand",  
  "actionName": "playFavorites",  
  "input": {  
    "favoriteId": "1234",  
    "playModes": {  
      "shuffle": true  
    }  
  },  
}
```

## Thing Events

```
{  
  "messageType": "ThingEventTriggeredEvent",  
  "id": "99cc08b3-23c4-4656-aa72-b15e45f47e96",  
  "timestamp": "2019-12-06T08:29:32.431Z",  
  "version": "1.0",  
  "homeId": "homeId",  
  "thingId": "qivicon:dect:eurotronic_doubleWallSwitch_v1:0001:1",  
  "eventType": "ShortPressedEvent",  
  "data": {  
    "foo": "bar"  
  }  
}
```

# Challenges

- Use a higher abstraction „purpose“ instead of device category for icons
  - Bulb or Lightstrip vs Lighting
  - AlarmSystem vs PresenceMonitoring or LifeProtection or DamagePrevention
- Group of Things
  - Rooms, Floors, Virtual Groups have user chosen names
  - Room, Floor, Group as Thing or different concept?
  - N:M relationship
- Personal ownership of Things
  - Devices can belong to persons
- Things are managed by some 3rd party connection

# Challenges

- Parent/child relationships between Things:
  - AlarmSystem and Sensors
  - SoundSystem, Loudspeaker Group and LoudSpeaker
  - Remote Control and different types of Buttons
  - Camera and optional SSD card
- Update mechanism of Things
- Last update and last changed timestamp for properties

```
{  
    "$schema": "./thing_schema.json",  
    "id": "qivicon:dect:awox_color_bulb_v1:0001",  
    "category": "ColorLightBulb",  
    "purposes": ["ColorLighting"],  
    "type": "PhysicalDevice",  
    "title": "LED Bulb E27 color",  
    "sourceTitle": "LED Bulb E27 color of the source",  
    "description": "LED Bulb E27 color",  
    "tags": ["tag1", "tag2"],  
    "group": false,  
    "metadata": {  
        "vendor": "AWOX",  
        "hardwareVersion": "Awox-SMLdu-c9-E27-001",  
        "firmwareVersion": "XYZ"  
    },  
    "thingSetIds": ["99cc08b3-23c4-4656-aa72-b15e45f47e96", "99cc08b3-23c4-4656-aa72-b15e45f47f92"],  
    "connection": {  
        "connectorId": "qivicon-gateway",  
        "connectionId": "userId-gatewayId-homeId",  
        "updateMechanism": {  
            "type": "Polling",  
            "pollingInterval": "PT30M"  
        },  
        "deletable": true  
    },  
    "properties": {  
        "connectionStatus": {  
            "propertyType": "ConnectionStatusProperty",  
            "title": "ConnectionStatus",  
            "description": "The connection status.",  
            "type": "string",  
            "enum": ["online", "offline"],  
            "lastUpdated": "2019-12-06T08:29:32.431Z",  
            "value": "online"  
        },  
        "on": {  
            "propertyType": "OnOffProperty",  
            "value": "off"  
        }  
    }  
}
```

```
{  
  "@context": [  
    "https://www.w3.org/2022/wot/td/v1.1",  
    {  
      "mza": "http://magentazuhause.app/wot/td-extensions.schema.json"  
    }  
  ],  
  "title": "editDor Thing",  
  "id": "http://api.telekom/households/123/things/qivicon:dect:awox_color_bulb_v1:0001",  
  "mza:category": "ColorLightBulb",  
  "mza:purposes": ["ColorLighting"],  
  "mza:metadata": {  
    "vendor": "AWOX"  
  },  
  "mza:tags": ["tag1", "tag2"],  
  "properties": {},  
  "actions": {},  
  "events": {},  
  "links": [  
    {  
      "href": "http://api.telekom/households/123/things/qivicon:dect:awox_color_bulb_v1:0002",  
      "rel": "http://api.telekom/link-relations#child-of",  
      "type": "application/td+json"  
    },  
    {  
      "href": "http://api.telekom/households/123/rooms/123124",  
      "rel": "http://api.telekom/link-relations#part-of-room",  
      "type": "application/json"  
    },  
    {  
      "href": "http://api.telekom/households/123/things/qivicon:dect:awox_color_bulb_v1:0004",  
      "rel": "http://api.telekom/link-relations#parent-of",  
      "type": "application/td+json"  
    },  
    {  
      "href": "http://api.telekom/vendors/sonos",  
      "rel": "http://api.telekom/link-relations#vendor",  
      "type": "application/json"  
    },  
    {  
      "href": "http://api.telekom/products/1234",  
      "rel": "http://api.telekom/link-relations#product",  
      "type": "application/json"  
    }  
  ]  
}
```

# Challenges

- Binding Template and Protocol **Vocabulary** for GraphQL
- "safe": false on properties
  - By which action is a property modified
  - Which properties does an action modify
- Update mechanism (none, polling, real-time) and interval on property-basis
- Context of a property: indoor vs outdoor
  - User can use the device differently
- Dynamically adjust the actions which are possible based on the state of the device
- Can a property be locked/unlocked?