W3C WoT IG
Sunnyvale face to face meeting

TF-AP breakout results
&
consensus proposals

Breakout results of
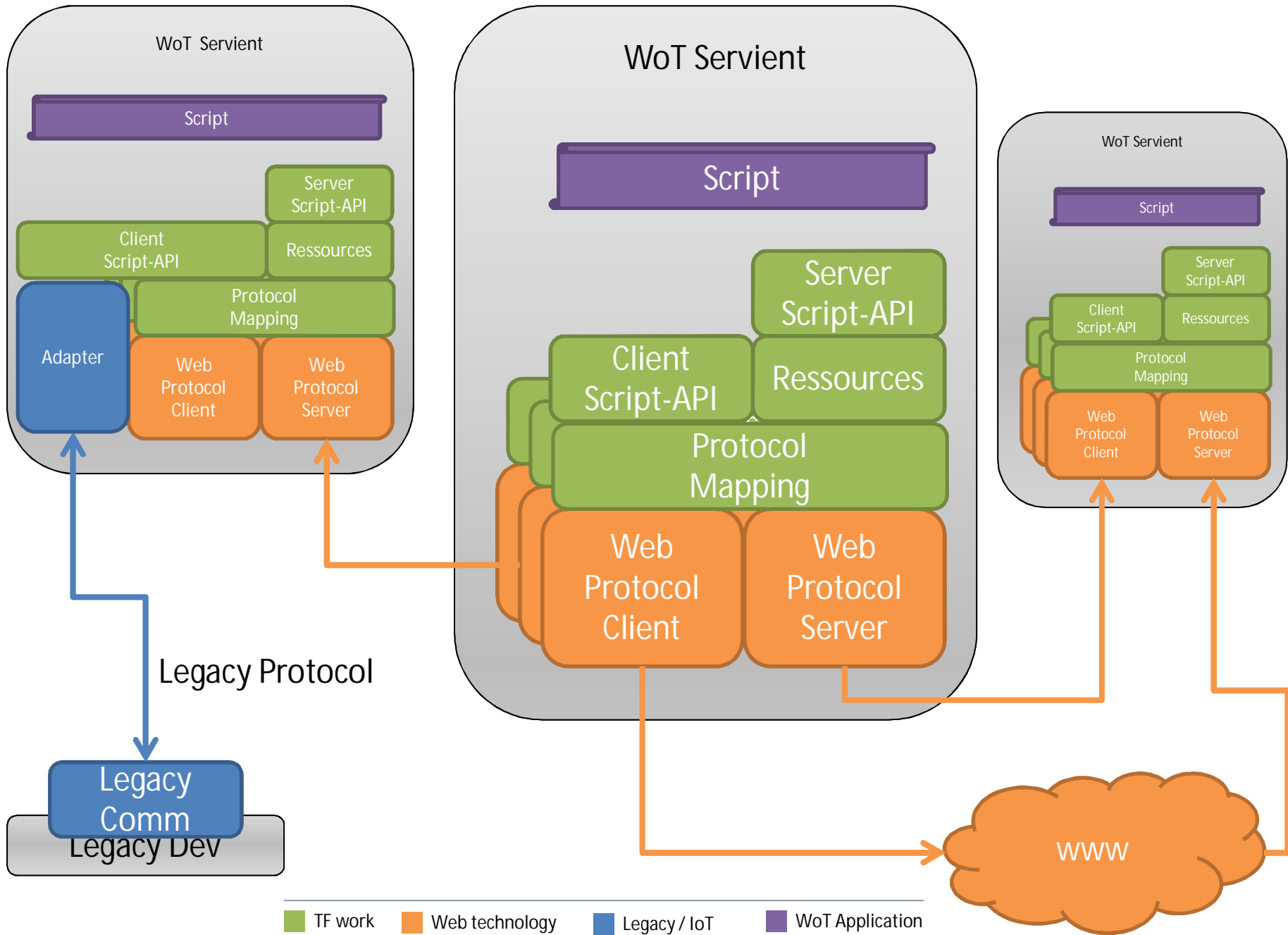Task force on API and protocol mapping

Discussion outcomes of TF-AP

- Architecture Model
  - Merged architecture model
- Technology Landscape
  - Relevant IoT resp. Web protocols and technologies
- Lifecycle states
  - State transitions for a Thing
- Abstract Resource Model
  - Protocol-agnostic typed resources for web things: Properties, Actions and Events/Subscriptions

Architecture Model

consensus proposal
Needs further iteration

WoT Servient

Script

Server Script-API

Client Script-API

Ressources

Protocol Mapping

Adapter

Web Protocol Client

Web Protocol Server

WoT Servient

Script

Server Script-API

Client Script-API

Ressources

Protocol Mapping

Web Protocol Client

Web Protocol Server

WoT Servient

Script

Server Script-API

Client Script-API

Ressources

Protocol Mapping

Web Protocol Client

Web Protocol Server

Legacy Protocol

Legacy Comm

Legacy Dev

WWW

TF work   Web technology   Legacy / IoT   WoT Application

Points to address

- Orange vs. Blue – when is a protocol considered a web protocol
- Add constrained device: One protocol, fixed ressources, no APIs
- What is the minimal servient?
- Add one servient hosting several virtual instances
- Add services in the cloud
- One physical device can be represented by several virtual instances

Tech landscape

Structure proposal

Technology landscape of TF-AP

- Protocols
  - Protocols that allow to map the abstract model
  - Protocols that can be generically adapted
  - Legacy protocols
- Resource Models
  - Common resource models
  - Models from consortia or domains
- API patterns
  - Patterns used in scripting APIs that interface the web

Lifecycle states of a WoT Servient

What are the states and transitions we face?

States

- Offline / Standalone
    - Not in a network
- Online
    - In a network, but not in the WoT
- Registered / Paired
    - Paired with a backend / a WoT device
- Activated / Connected
    - Active connection and control

Abstract Resource Model

Consensus proposal

Discussion outcome of AP and TD

Protocol-agnostic thing model
for web things

API

Model

Protocol

Protocol-agnostic thing model for web things

- Defines "Elements" and Interactions
  - Abstract level, e.g. to be mapped to protocols
  - Protocol for interaction can be determined at runtime
  - Architecturally ensure: scalability, security, robustness
- Properties
  - Runtime properties of the Thing
  - Static properties are declared in the TD
- Actions
  - Invocable actions on a thing
  - May or may not result in state change
- Subscriptions/Event Sources
  - Intention to be notified on a certain condition

Runtime Properties

- Read-only
  - Operations: read
  - scalar or lists/ structured types
- Read/Writable
  - Operations: Read, Write
- Configurations etc.
  - Operations: CRUD
- Dynamic
  - Operations: Read, Write, Subscribe/Observe
  - Spontaneous nature (Events)
  - continuous timeline of value changes (Streams)
    - Higher interactions: Filtered reads etc.

Actions

- Invocable action on the physical thing.
- Retrieve a description, invoke execution
- Possibly manage running execution
- Can or cannot issue a state change
- Enables:
  - atomic change of multiple resources
  - Long-running executions
  - Semaphores (restrict executions)

Next steps

Next steps / Goals for TPAC

Next steps

- Complete and transfer Tech landscape:
  - http://w3c.github.io/wot/landscape.html
  - https://www.w3.org/WoT/IG/wiki/APIs_and_Protocols_TF#Technology_Landscape
- Evaluation of Models
  - Outreach to protocols and platforms
  - Modelling of/for use cases
  - Exploratory implementations