

Broadband Forum Machine-to-Machine (M2M) Solutions

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The information in this presentation is public



Broadband Forum

Engineering smarter & faster connections

Architecting a connected lifestyle

- Defining best practices for global networks
- Enabling multi-service and content delivery
- Establishing technology migration strategies
- Engineering critical device & service management tools
- Redefining Broadband

● Who are we?

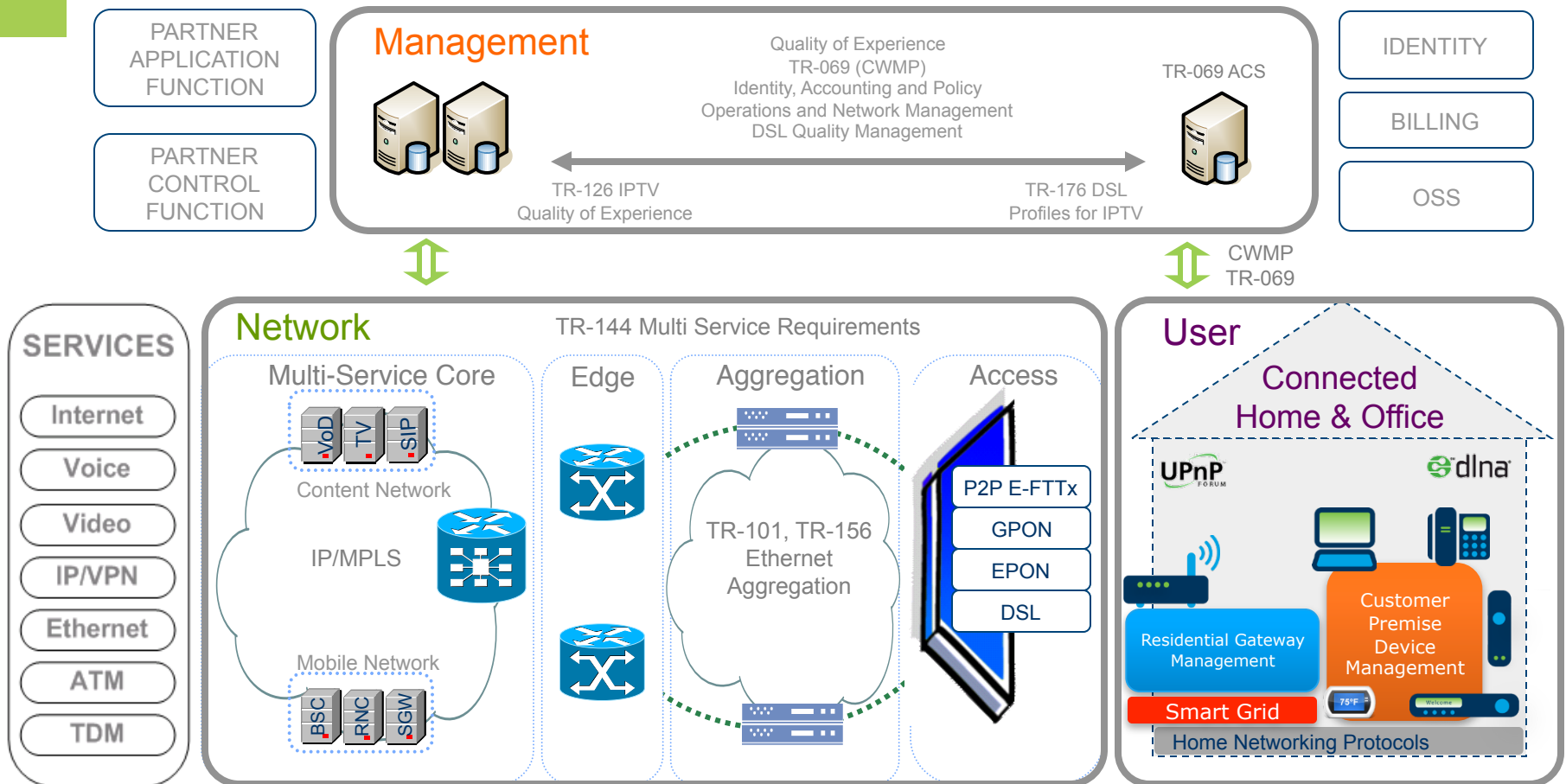
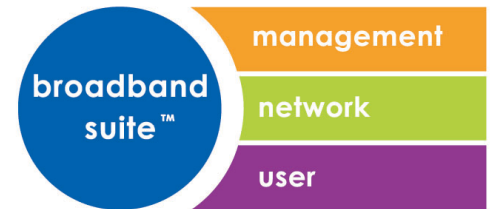
- Industry consortium made up of approximately 200 service providers, vendors, consultants, academia and test labs
- Predominant broadband industry forum since **1994**
- Engineer technology solutions to help service providers achieve standards based, economical and effective broadband deployments

Broadband Forum Service Provider Members – driving requirements

Broadband Forum Service Provider Members



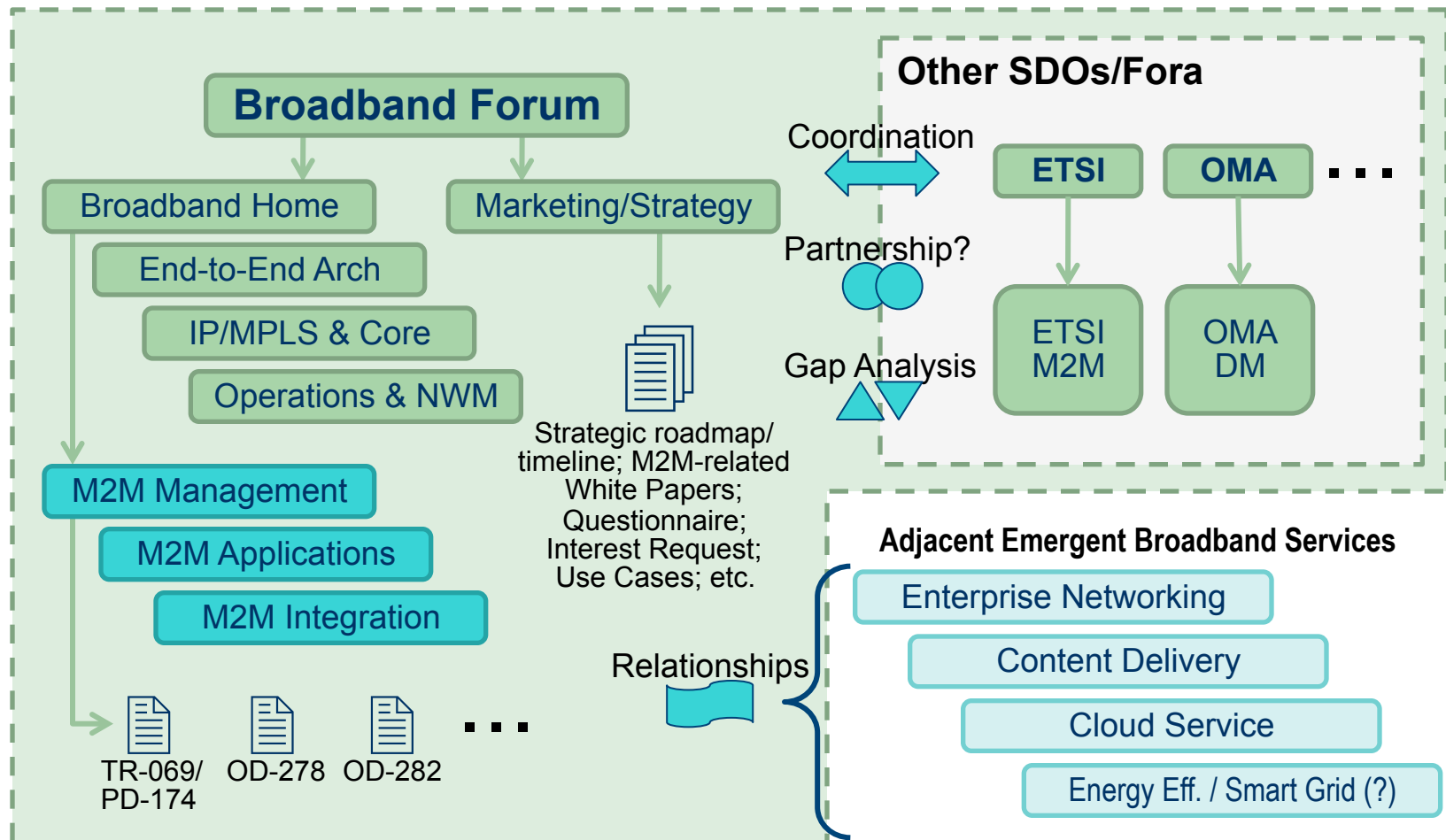
Broadband Forum Scope



Multi Service Architecture & Requirements

Certification, Test and Interoperability

BBF and M2M Ecosystem



Broadband Forum – Home Group

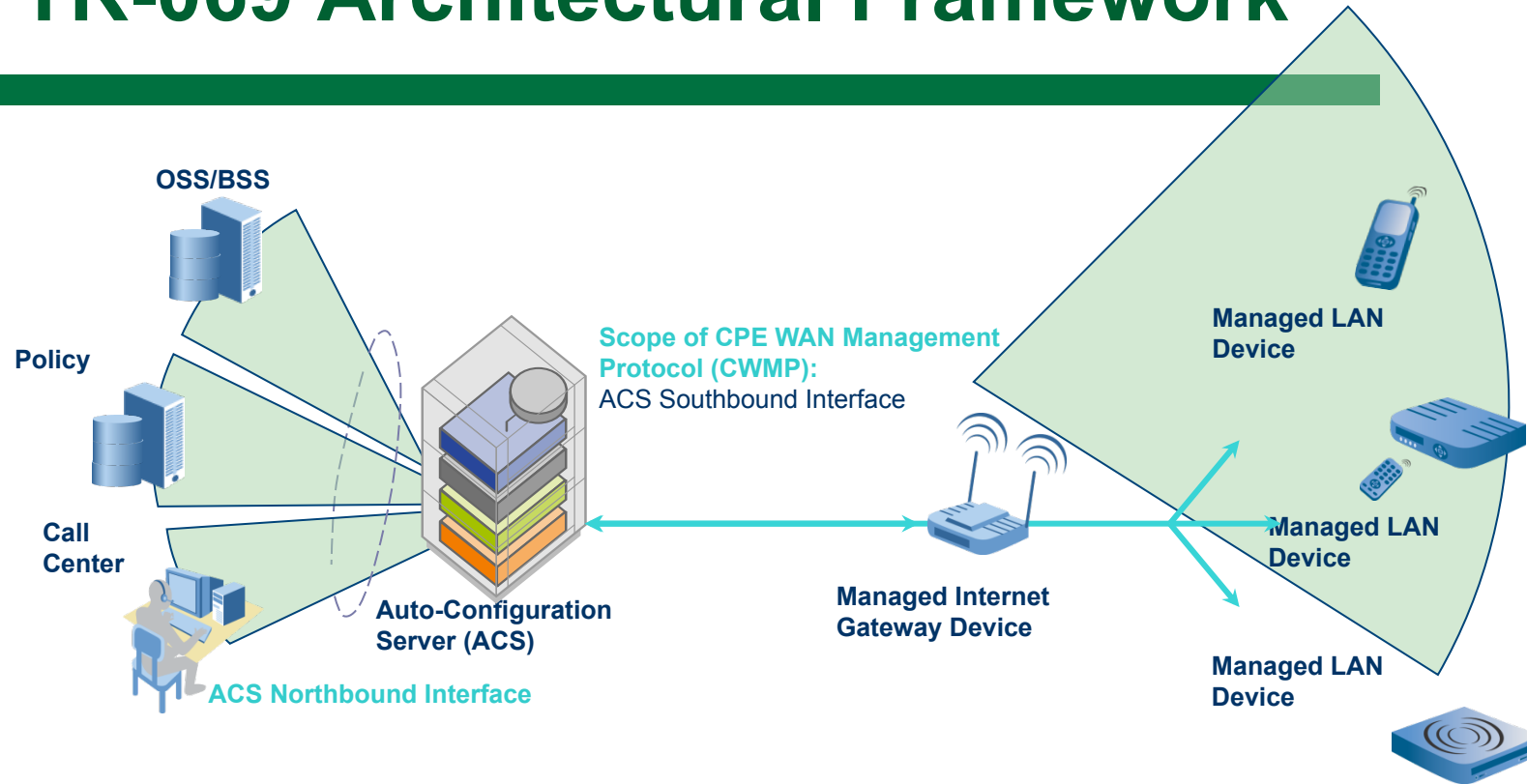
- Focus on Home Networking devices functionality, capability and connectivity.
- Proven scalable protocol solutions connecting the central office to customer premise.
- Enabling new services with recent Technical Reports.
- Strong interoperability track record, regular test events for its protocols since 2005.
- Consistent and growing liaison relationships with other SDOs (OMA, 3GPP, ETSI. etc)

Broadband Home – Device Management

TR-069 – CPE Wan Management Protocol (CWMP)

- Industry leading device management solution.
- Evolving TR-069 family of extensive and modular manageable ‘objects’ covering wide range of devices and functionality.
- Referenced by many industry bodies such as 3GPP, ATIS, ETSI and ITU-T.
 - ❑ Approved as a European standard in 2010 by ETSI.
 - ❑ Currently referenced in ETSI M2M architecture as a protocol for device management that runs over the “mld” reference point.
 - ❑ Ongoing work between the Broadband Forum and ETSI M2M to develop new Object model work.
- Well over 70 Million devices connected.
- Ratified by DSL (now Broadband) Forum in May 2004, amended in 2006 and 2007 and recent M2M driven amendments amendment 3 and 4 in 2011.

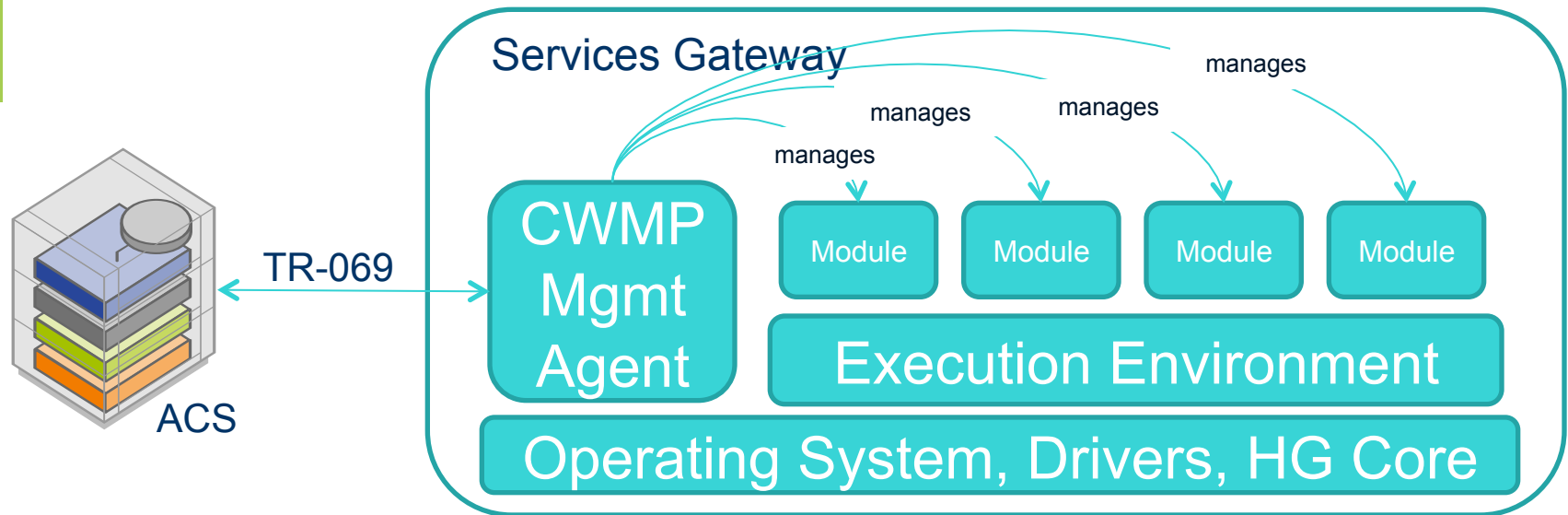
TR-069 Architectural Framework



- Management Functions
 - Bootstrap
 - Service Provisioning
 - Firmware and Software Module Management
 - Diagnostics
 - Fault and Performance Monitoring
 - Large and growing set of defined object models

Software Module Management

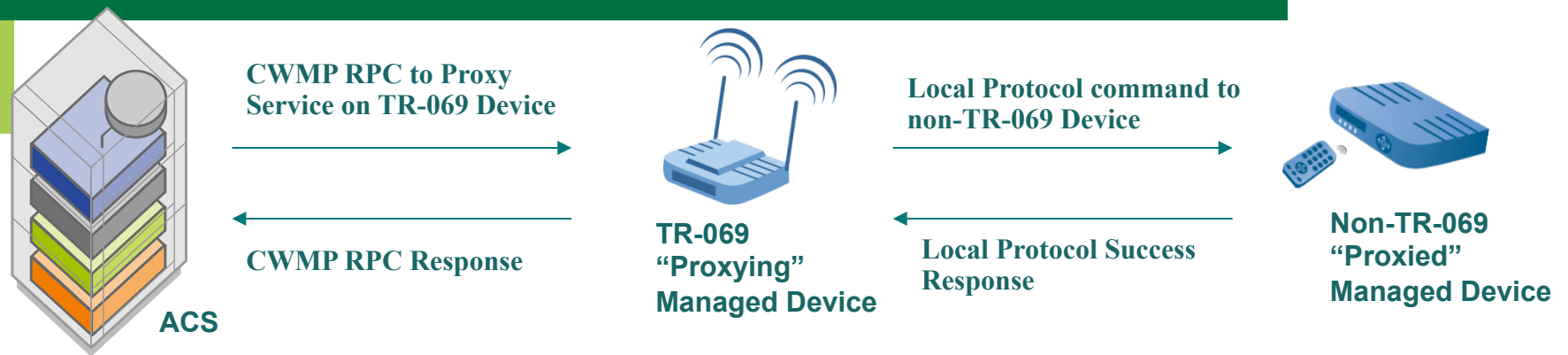
TR-069 amendment 3



- Software Module Management to support embedded applications.
- Open design for mapping to multiple Execution environments (OSGi, OMA, etc).
- New RPC and Software Module Data Model support required.

Remote Management of non-TR-069 Devices

TR-069 amendment 4



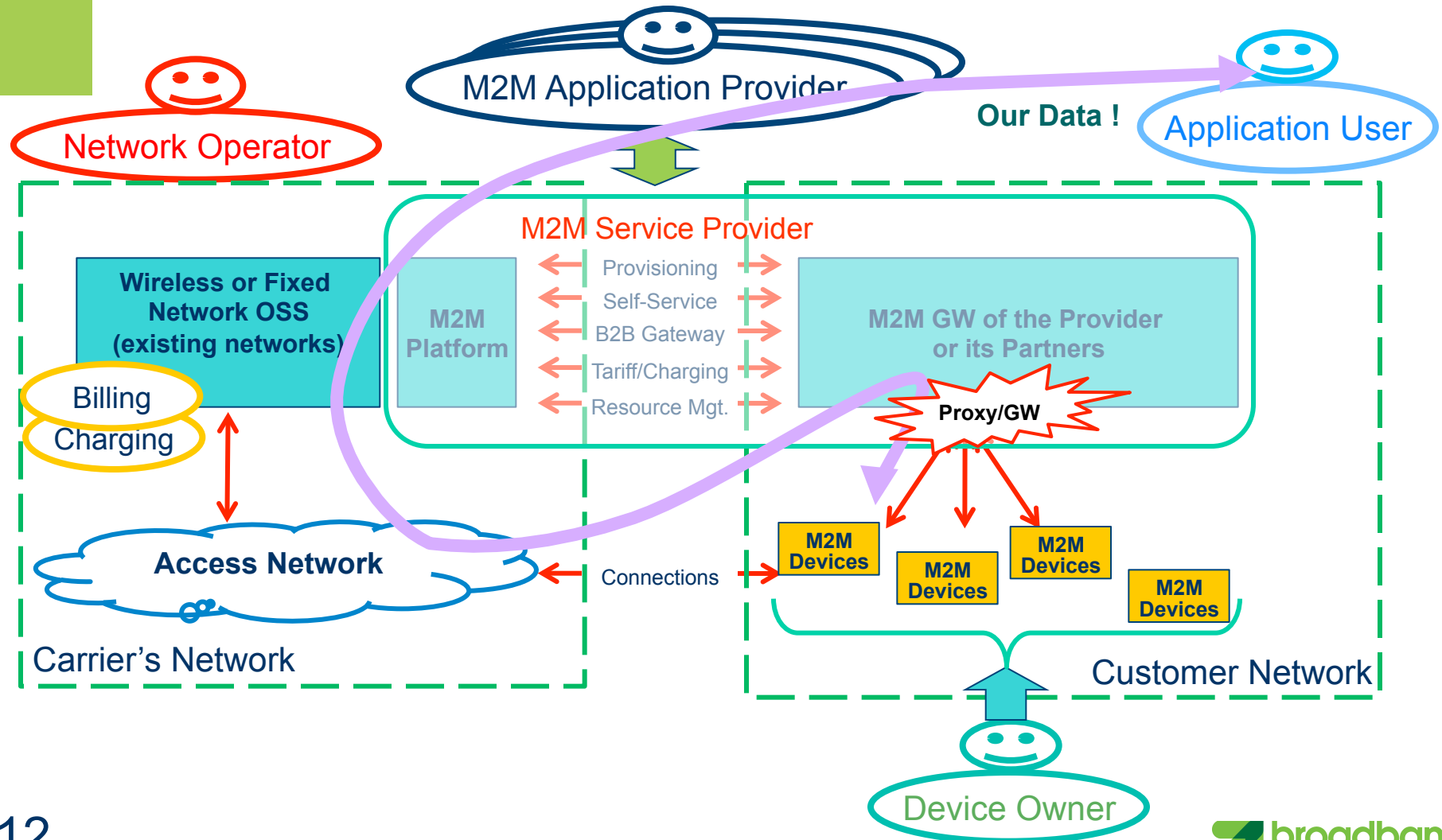
- Proxy management agnostic to the local protocol
 - UPnP DM/DLNA, Zwave, ZigBee etc.
 - Layer 2 protocols (e.g. HomePlug OAM, etc.)
 - Any proprietary local protocols known by the proxying device
- TR-069 accesses proxied devices through TR-069 embedded and virtual managed objects
 - ACS sends management commands to proxying device
 - TR-069 device converts TR-069 commands to local protocol
 - Once proxied device has successfully executed commands, TR-069 device sends CWMP messages to ACS

Broadband forum M2M Next activities: Identify GAPS Critical for Service Delivery

- Continue work on current BBF specifications for **Management Plane**.
 - New work started to incorporate ETSI M2M Data models
 - Potential BBF management specifications for a standard **North-Bound Interface** (NBI) for interfacing to new services.
 - Continued exploration of M2M networks and paradigms.
- Emerging work on **Control Signaling and Data Abstraction** to M2M devices as key enabler to service delivery to provide connectivity to growing ecosystem of devices.

Motivation: M2M Value and Value Chain

Key M2M Stakeholders



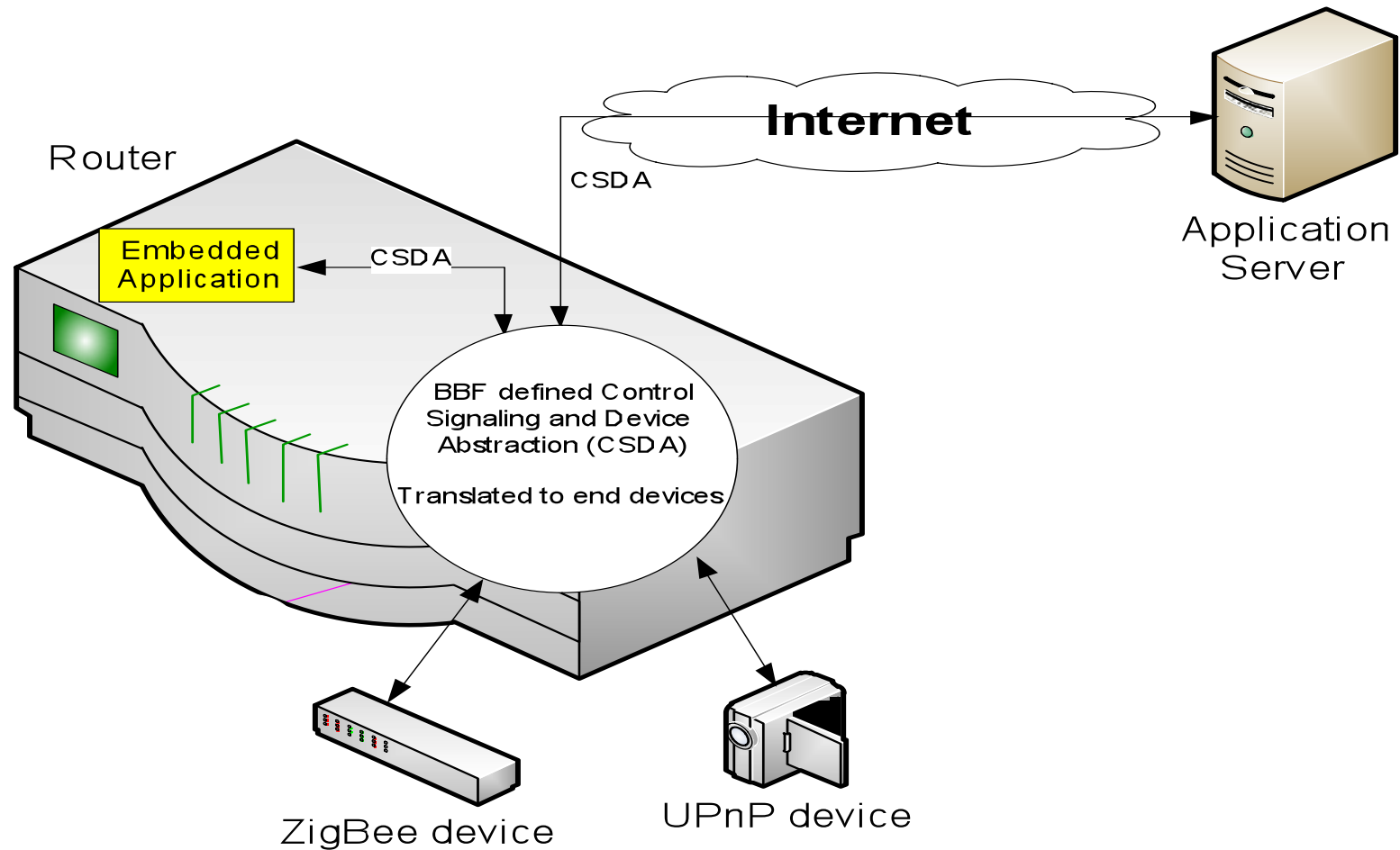
M2M Activity : Ongoing TR-069 Work

- OD-278 to study a set of M2M use cases in order to verify extended verticle scenarios impact to TR-069, identify new object models and potentially identify GAPS.
- Identify overlapping or related standardization work in other fora/SDOs involving device management and object model work.
- Current analysis:
 - M2M (local) area networks: new constraints, e.g. large number of devices, autonomy capabilities, heterogeneity
 - Interworking with ETSI TC M2M data models.
 - Data modeling → potential model extensions
 - Protocols → potential protocol extensions

M2M activity – Control Signaling & Data Abstraction (CSDA)

- **Horizontal solution for enabling end device communication for countless Vertical Services.**
- **Build on recent work to enable services in the Smart Home.**
 - Devices enabled with Execution Environment to provide embedded applications to enable services.
 - Devices enabled with Proxy Management able to provision and manage growing ecosystem of M2M/IoT devices.
- **“Missing piece” essential to Service Providers to provide common device abstraction and signaling for new M2M related services.**
- **Completed analysis Phase communicating with other SDOs (20+ liaisons) M2M work.**
- **Build on the Broadband Forum competency and leadership in large scale device communication solutions.**

Control Signaling & Device Abstraction



Control Signaling and Device Abstraction:

- **Connection to non-IP and legacy devices**

- Access to existing devices (and gateways) on existing network technologies, requiring no modifications.
- Not management plane – “Instant / real time” command communications.

- **Control Signaling & Device Abstraction**

- Provides access to all devices using common communication and common objects, enabling an seamless extensible ecosystem.
- Provide technology agnostic access by embedded and cloud applications.

- **Build on work in ETSI M2M Release 1**

- Evaluate ETSI M2M mechanisms for addressing, connectivity, instant communication, discovery, notifications etc.
- Insure a scalable solution for all devices, both IP and Non-IP
- Identify architecture critical functionality.
- Provide implementation friendly solution

OMA liaison discussion

- Reached out to OMA with OD-282/OD-278 liaison
- OMA responded with CPNS documents (2011.1254) and Device management discussion (2011.1297)
- Broadband forum to evaluate Lightweight M2M concerns about ETSI M2M during CSDA work.
- M2M is the intersection of Home networking and Wireless technologies.
- Synergies for BBF CSDA work and CPNS/Lightweight M2M architectures.
- oneM2M involvement and impact on Cloud and home networking standards.
- Synergies in sharing future management objects / maybe follow common framework for management objects

Thank you

