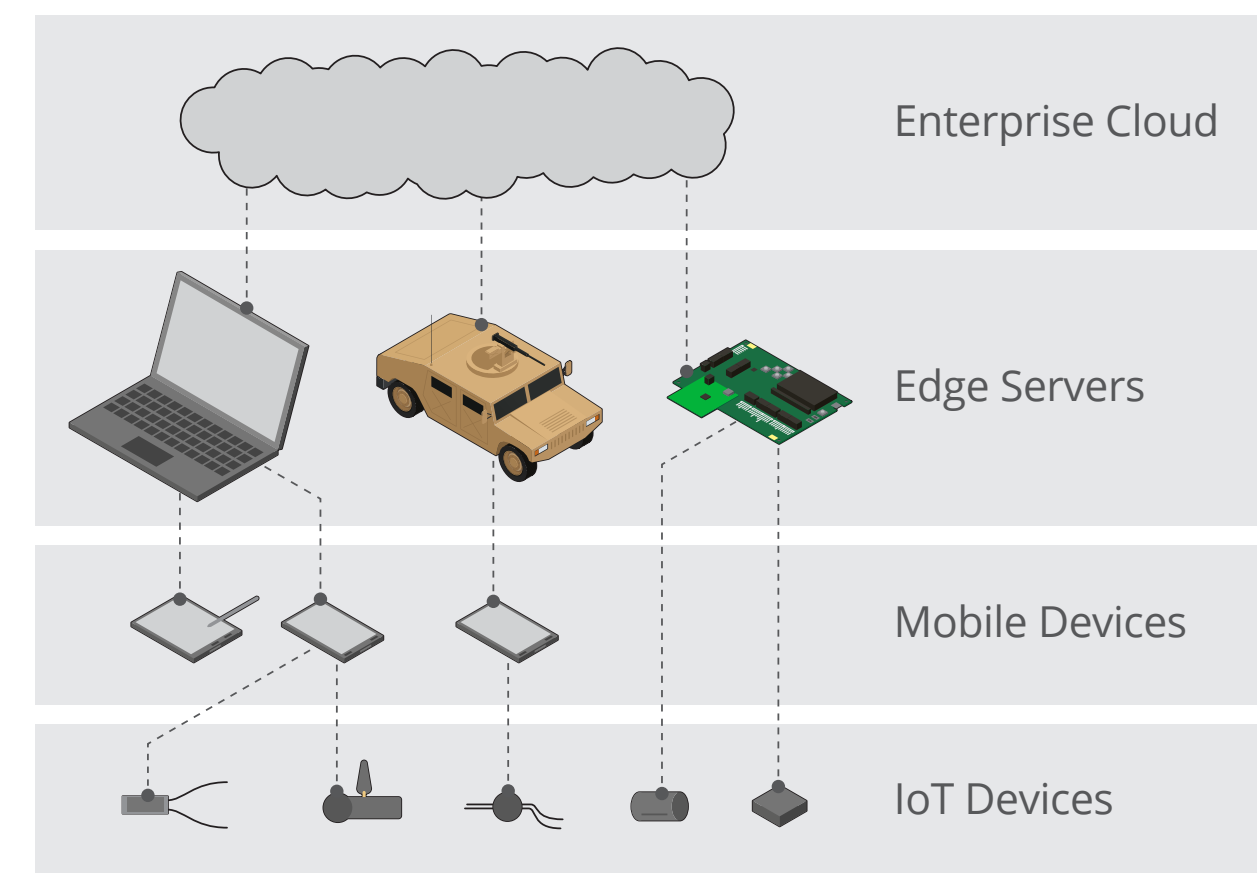


Two Perspectives on IoT Security

“IoT Security Standards” and “Software-Defined Networking for IoT Security”

FY17: Authentication and Authorization for IoT Devices in Edge Environments

Evaluation, adaptation, and implementation of an IETF proposal for authentication and authorization in constrained environments (ACE) to enable future integration of ACE-compliant IoT devices into DoD systems



Tactical Edge System

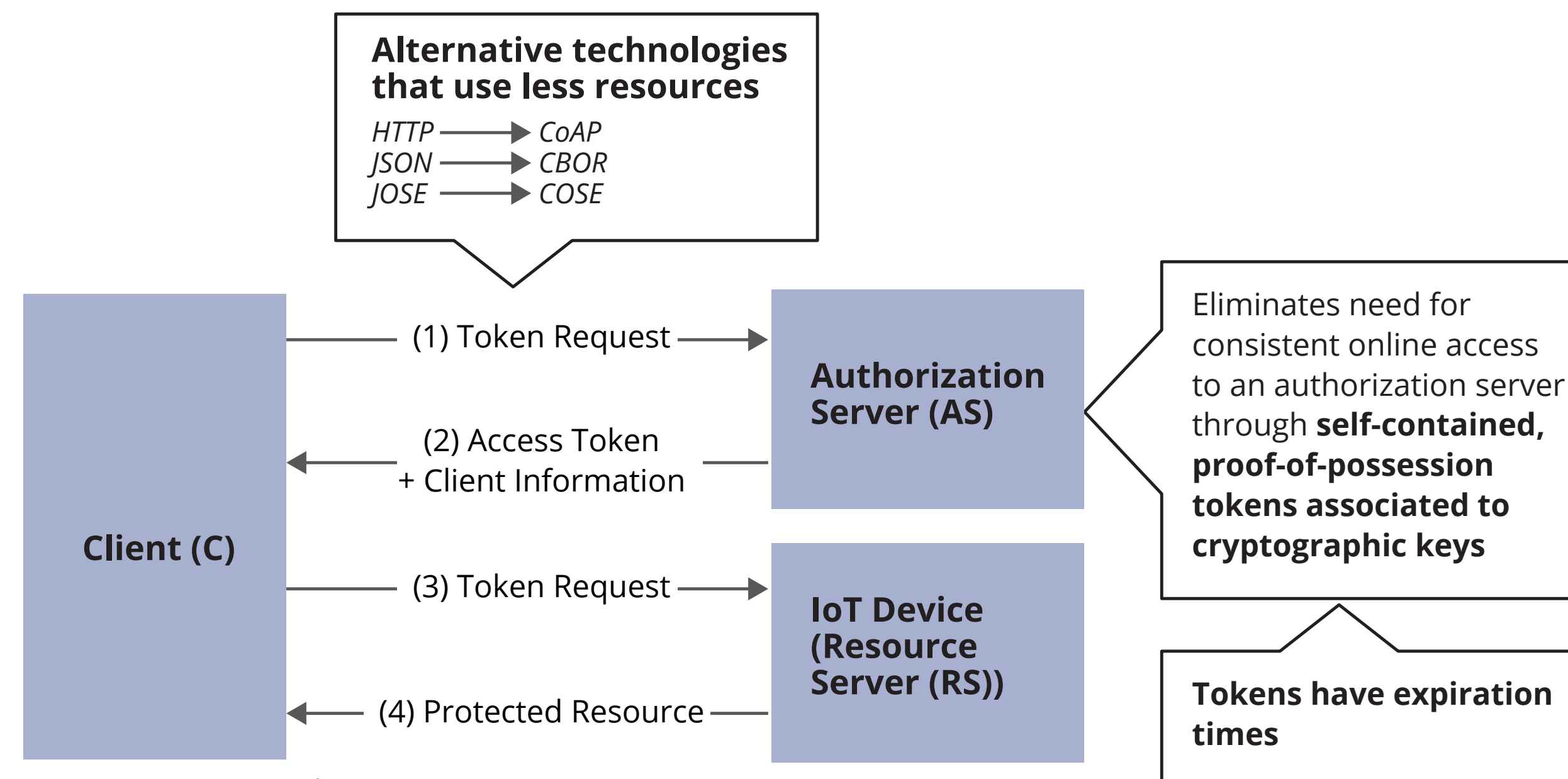
Goal:

Develop a solution for authorization and authentication of IoT devices that

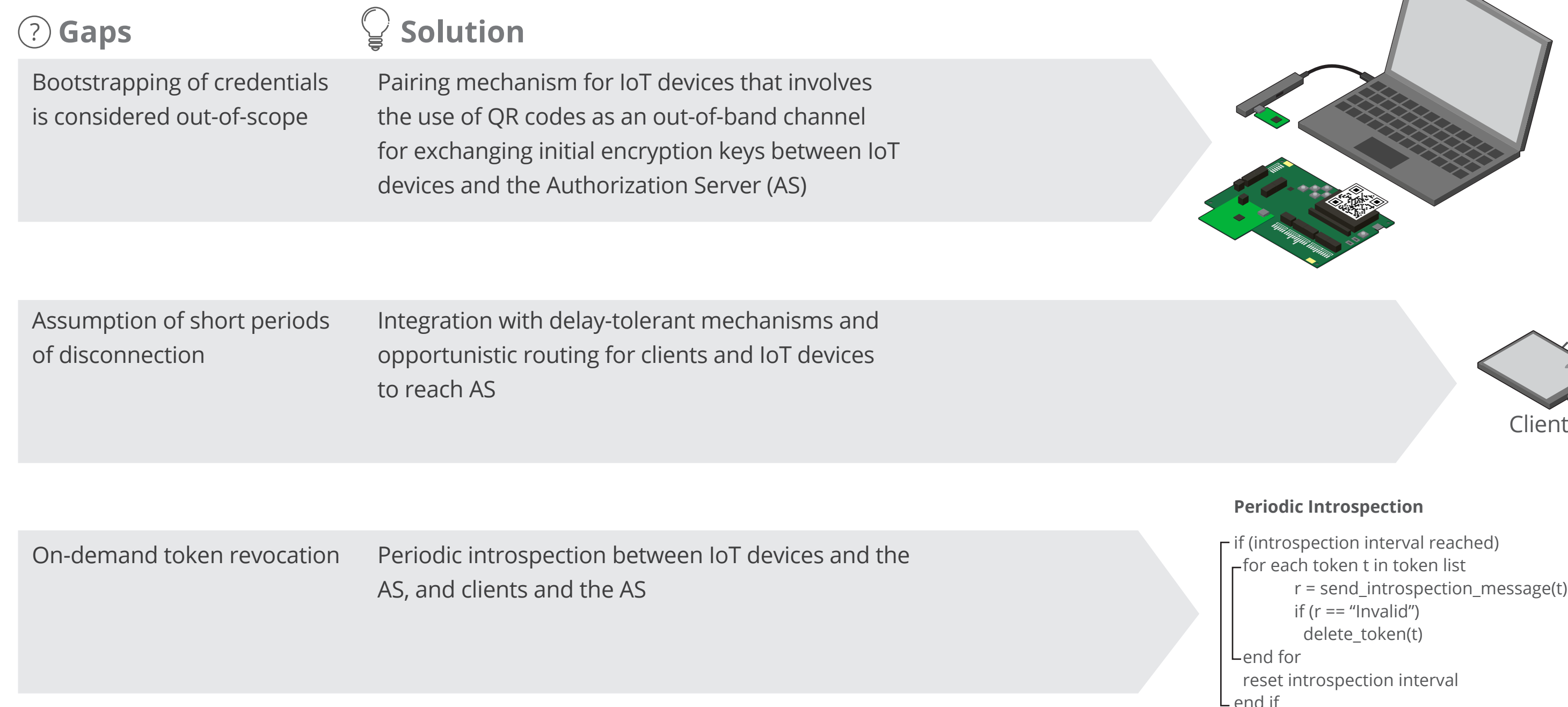
- addresses high-priority threats of tactical edge environments,
- operates in DIL environments, and
- considers resource constraints of IoT devices

ACE (Authentication and Authorization in Constrained Environments)

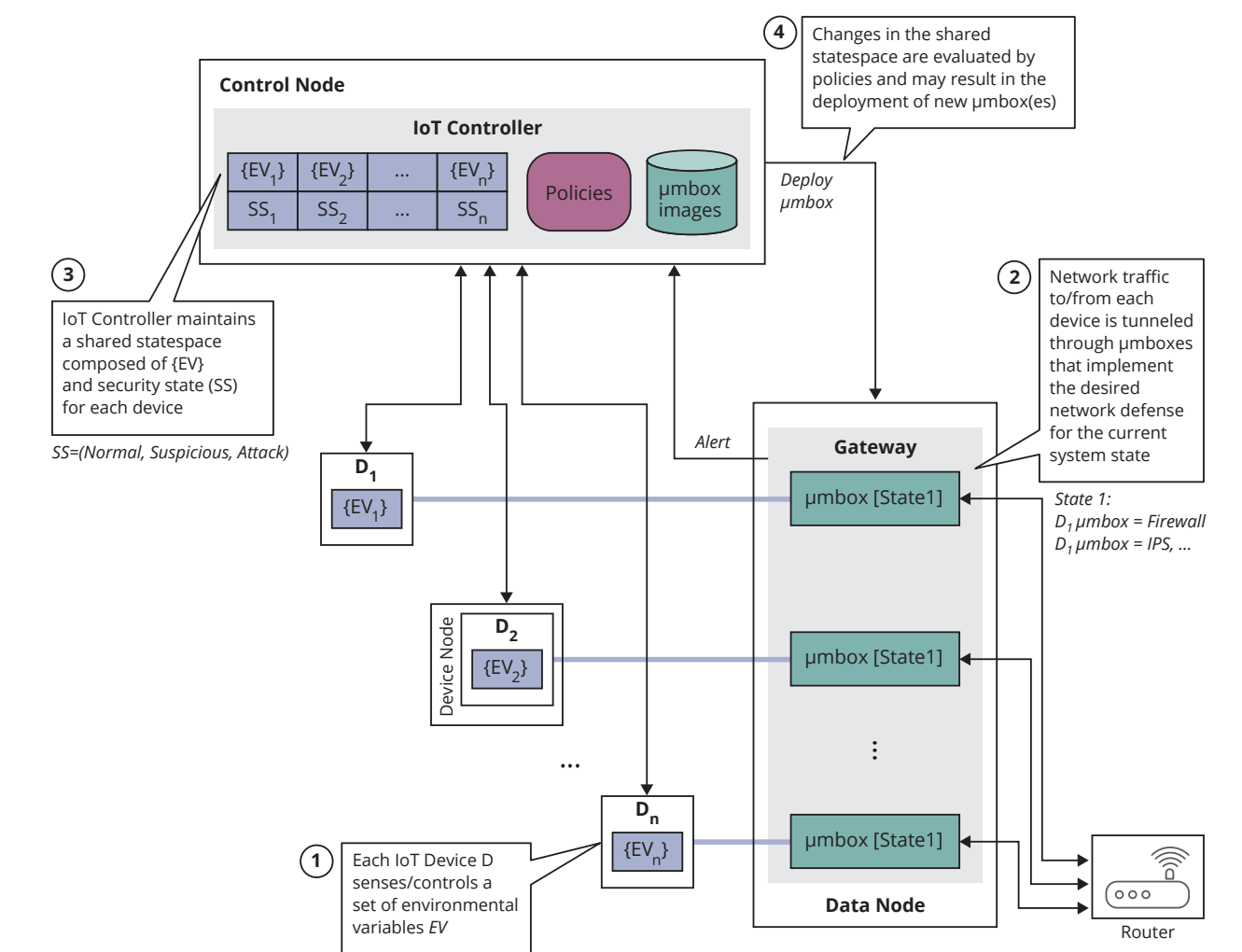
- IETF proposal in Working Group Status—next step is Proposed Standard
- Extends OAuth 2.0 to IoT devices
- Addresses some of the challenges of tactical environments



Threat modeling identified the following gaps in ACE.



FY18: High-Assurance Software-Defined IoT Security



Dynamic deployment of network defenses based on composite state analysis of all controlled IoT devices

Copyright 2017 Carnegie Mellon University. All Rights Reserved.

This material is based upon work funded and supported by the Department of Defense under Contract No. FA8702-15-D-0002 with Carnegie Mellon University for the operation of the Software Engineering Institute, a federally funded research and development center.

The view, opinions, and/or findings contained in this material are those of the author(s) and should not be construed as an official Government position, policy, or decision, unless designated by other documentation.

NO WARRANTY. THIS CARNEGIE MELLON UNIVERSITY AND SOFTWARE ENGINEERING INSTITUTE MATERIAL IS FURNISHED ON AN "AS-IS" BASIS. CARNEGIE MELLON UNIVERSITY MAKES NO WARRANTIES OF ANY KIND, EITHER EXPRESSED OR IMPLIED, AS TO ANY MATTER INCLUDING, BUT NOT LIMITED TO, WARRANTY OF FITNESS FOR PURPOSE OR MERCHANTABILITY, EXCLUSIVITY, OR RESULTS OBTAINED FROM USE OF THE MATERIAL. CARNEGIE MELLON UNIVERSITY DOES NOT MAKE ANY WARRANTY OF ANY KIND WITH RESPECT TO FREEDOM FROM PATENT, TRADEMARK, OR COPYRIGHT INFRINGEMENT.

[DISTRIBUTION STATEMENT A] This material has been approved for public release and unlimited distribution. Please see Copyright notice for non-US Government use and distribution.

Internal use:* Permission to reproduce this material and to prepare derivative works from this material for internal use is granted, provided the copyright and "No Warranty" statements are included with all reproductions and derivative works.
External use:* This material may be reproduced in its entirety, without modification, and freely distributed in written or electronic form without requesting formal permission. Permission is required for any other external and/or commercial use. Requests for permission should be directed to the Software Engineering Institute at permission@sei.cmu.edu.

* These restrictions do not apply to U.S. government entities.

Carnegie Mellon® is registered in the U.S. Patent and Trademark Office by Carnegie Mellon University.

DM17-0735
Two Perspectives on IoT Security