05/05/2025

Modernizing and Securing Cloud Connectivity for Ground Devices

Sydney Lovely & Brian Rundle

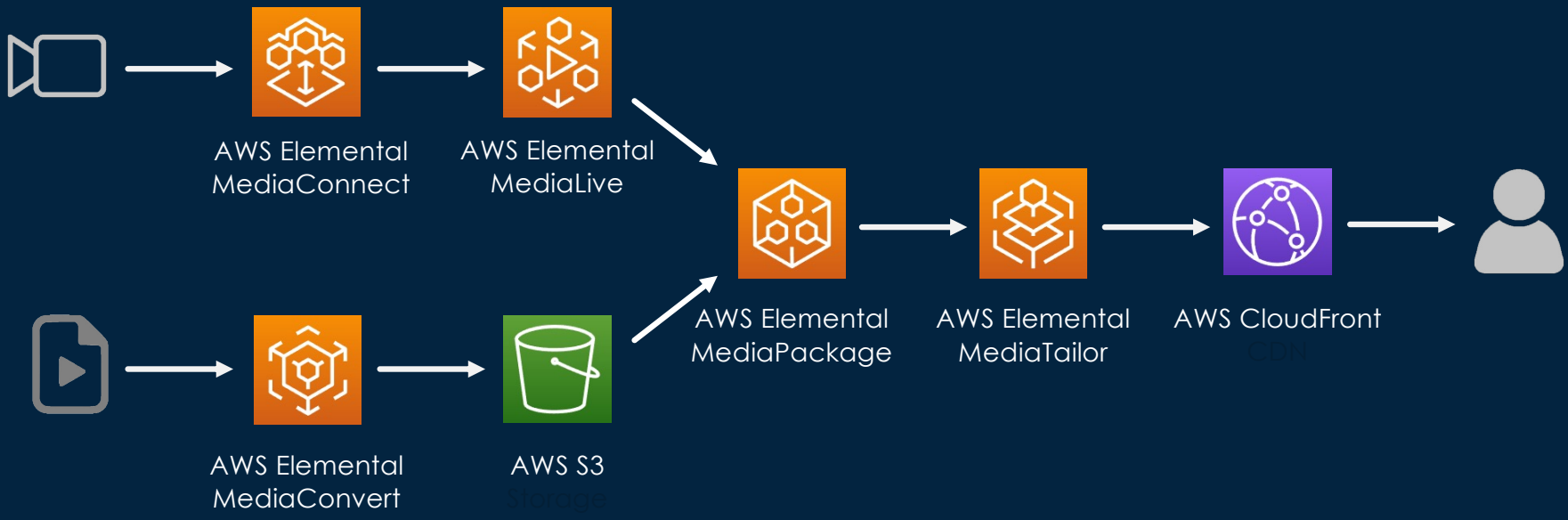
AWS Elemental MediaConnect

About the Presenters…

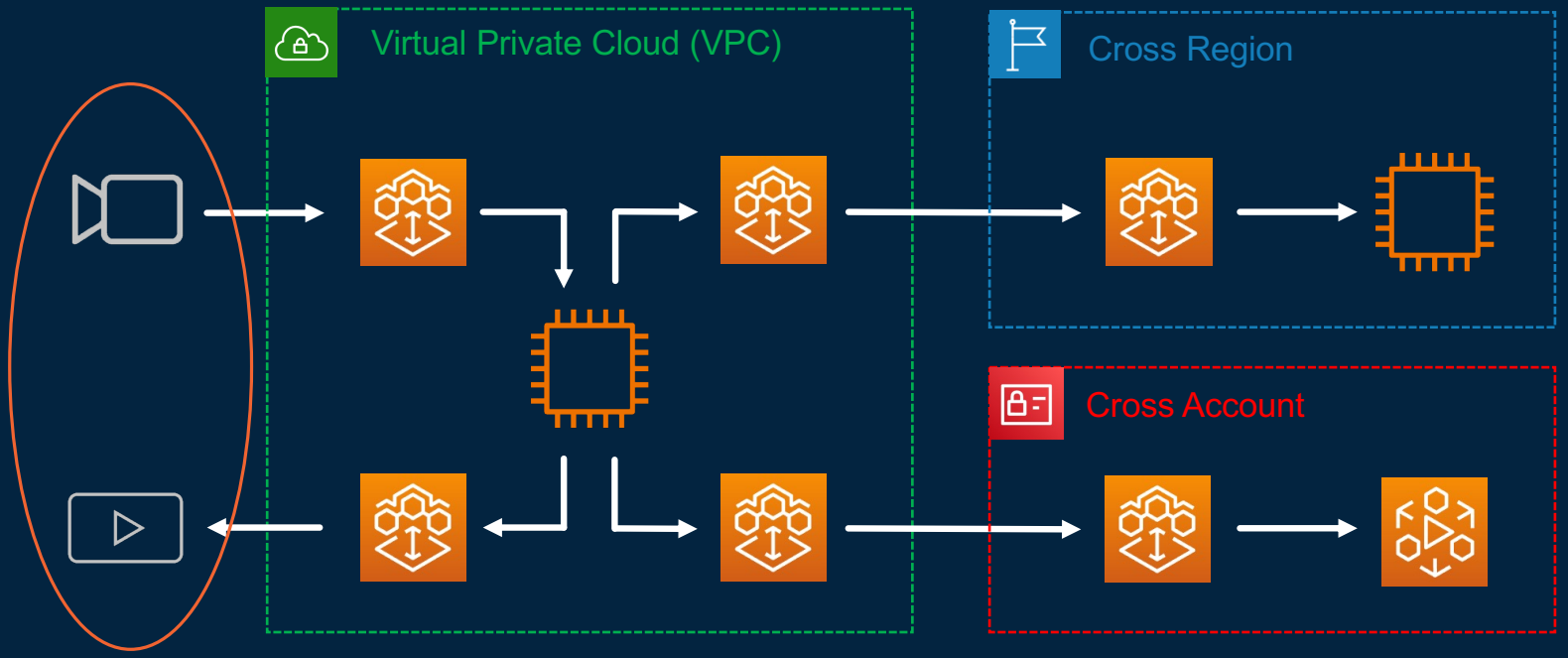
Sydney Lovely
Senior Software Dev Manager

Brian Rundle
Senior Software Dev Engineer

About AWS Elemental…



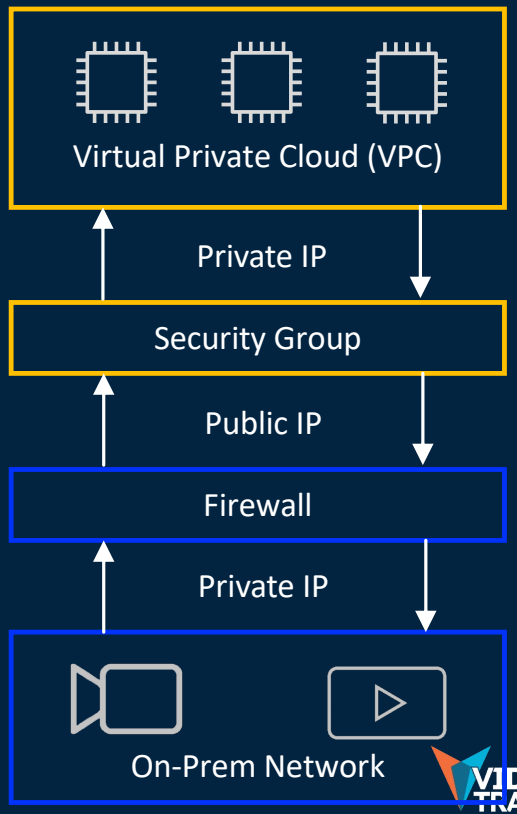
MediaConnect Use Cases



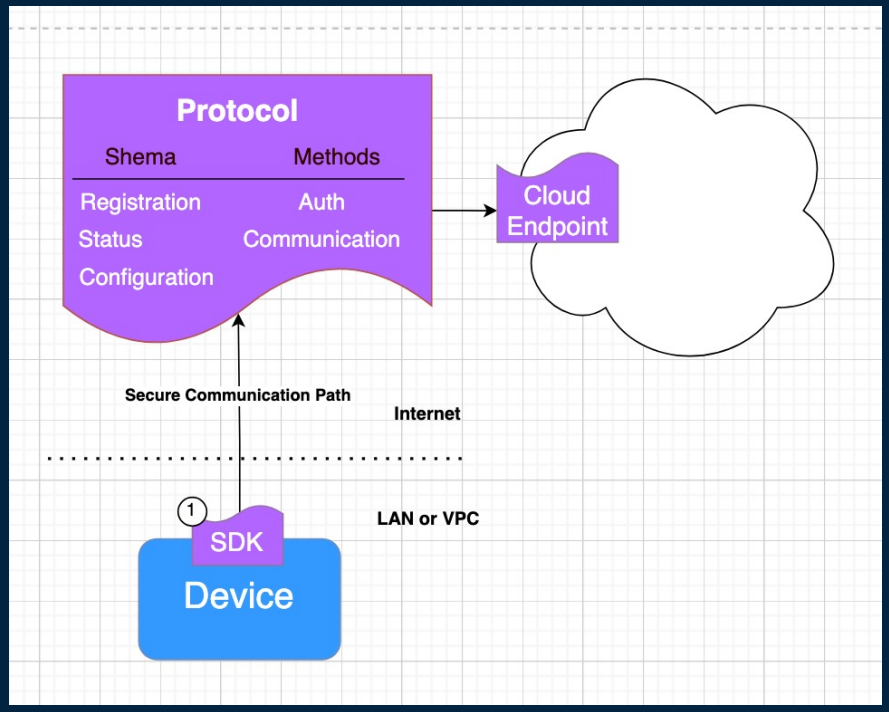
Customers tell us that the hardest part of cloud-based workflows is often connecting ground devices in the first place…

Simplifying Connection Management

- There are a myriad of transport protocols (RIST, SRT, TR-07, etc), but they all require networking skills to manage IP addresses, firewall rules and network address translation.
- By leveraging modern IoT technology, we can eliminate this complexity and enable even basic users to connect their devices with a simple pairing code process.
- We are proposing a technical recommendation (TR) for a new discovery, authentication and control protocol along with an open-source device SDK that can work with any transport protocol.



VSF Client Device Discovery (CDD) Proposal



Standardize

Discovery-Pairing

Communication Methodology

Payload

Provide:

Open-Source Client SDK

Client Application Reference Design

Service Endpoint Reference Design

Protocol / API definition

Today: Managing a remote device

Setup

1. Tunnel into the VPC
2. Find and login into each device
3. Setup using device's bespoke UI
4. Copy params
5. Possible via on-prem or local network admin

Running & Tearing Down

1. Stay logged to access status
2. Log back in, Start/Stop, Change Settings

Problem: *This access pattern does not scale*

- Maintaining fleet spreadsheet
- No central Monitoring active streams
- Setup is slow, cumbersome, error prone
- Devices not portable

With CDD: Managing a Remote Device

Setup

One time pairing into cloud registry

Running

Assign destination & start

Tearing Down

Stop

Benefits: **Access & Monitoring scales**

- Secure, modern registration process
- Automatic connection management
- Monitor complete workflow from cloud

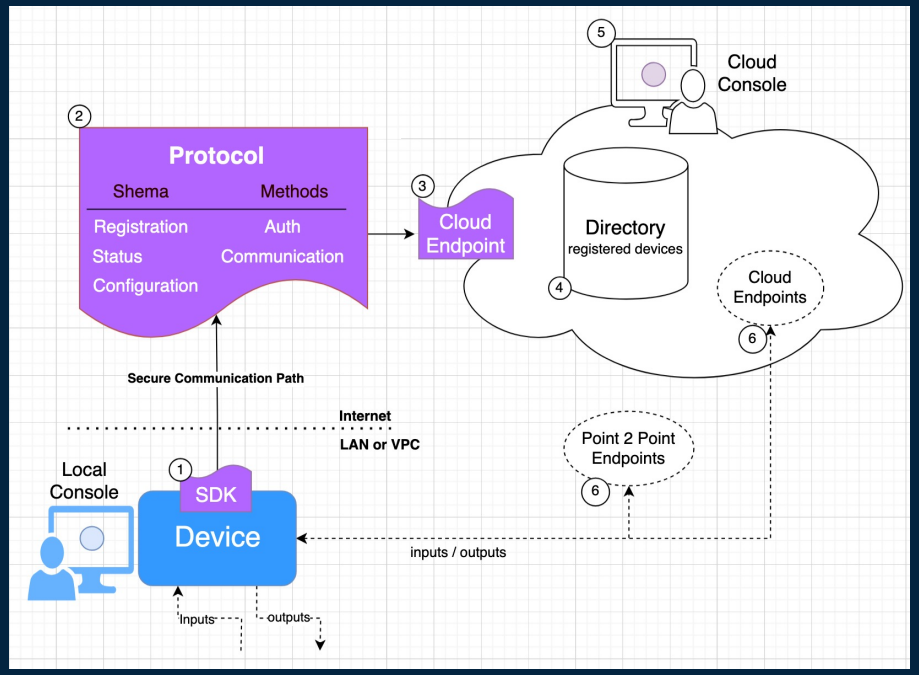
DEMO


Firefox File Edit View History Bookmarks Tools Window Help
Thu Feb 20 10:17 AM
PowerPoint Slide Show - [Modernizing Cloud Connectivity]
Client Device Discovery (CDD) SDK Demo
Problem Description
Demonstration Part 1: Before. Managing remote streaming workflows today
Demonstration Part 2: After: Using the Client Device Discovery SDK
, Inc. or its affiliates. All rights reserved. Amazon Confidential and Trademark.
17

Draft Technical Recommendation

A *system* for discovery, authentication and management of video device across network boundaries including the public internet.

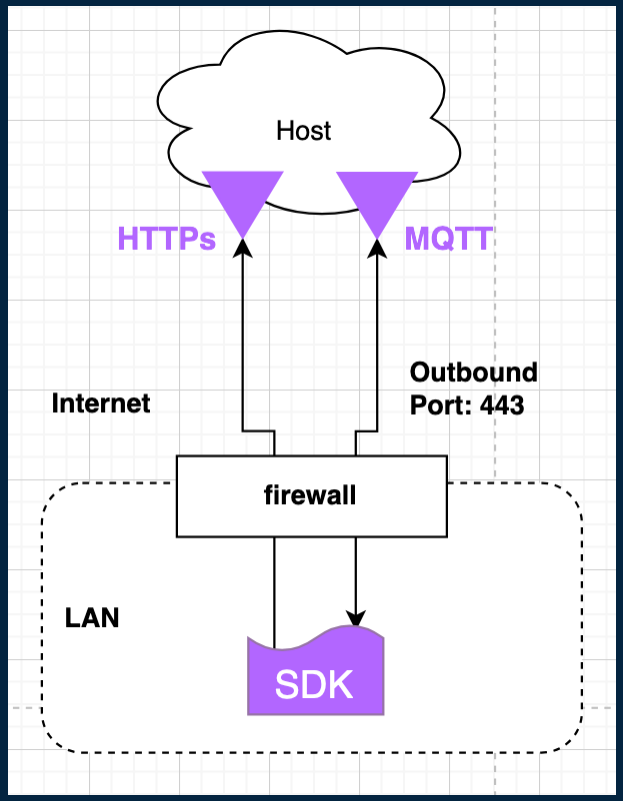
1. Open-Source Client SDK Reference Design
2. Message and Communication Protocol
3. Host Service in Public Cloud or Private Data Center



CDD Network Model

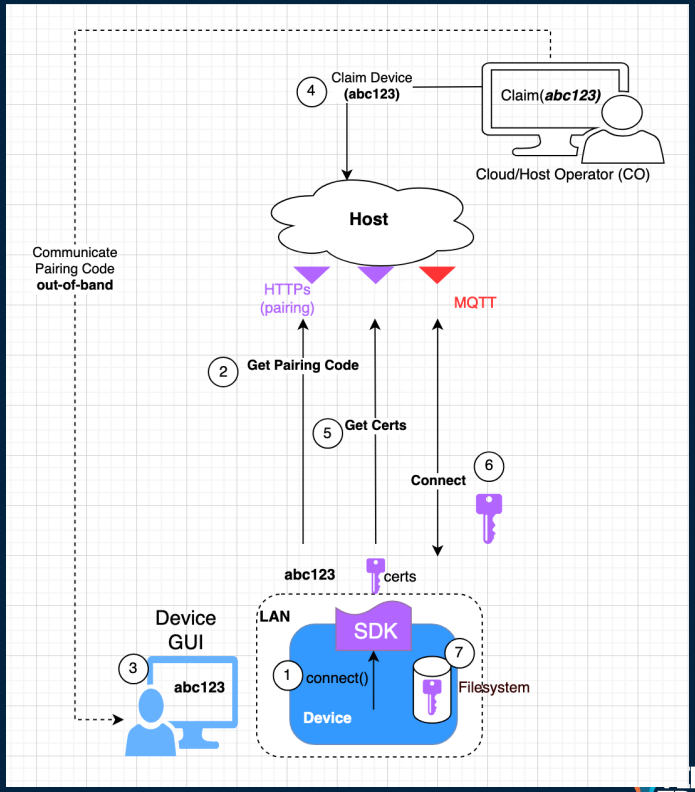
SDK reaches public endpoints vis HTTPS

1. Firewall rules need only allow Port 443 outbound
2. No Port forwarding required
3. No NAT / Gateway settings



Registration and Pairing Process

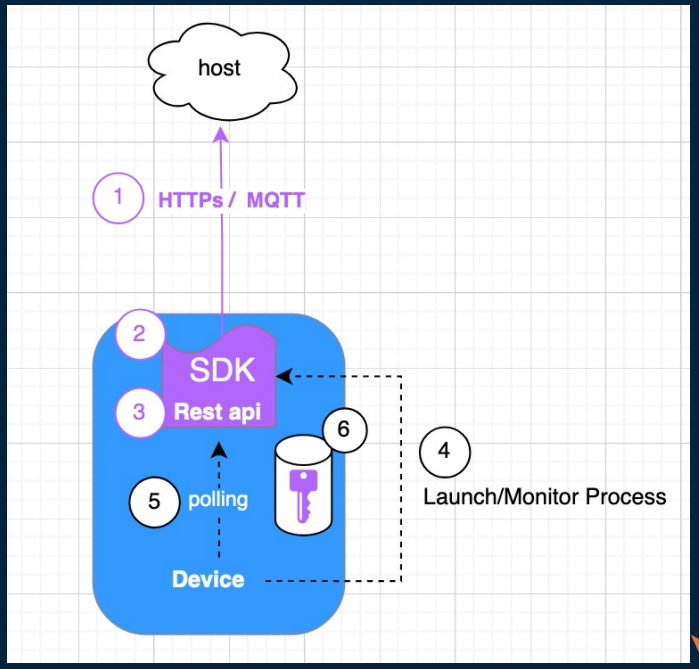
1. Start SDK: Connect()
2. Device gets pairing-code from service
3. Code is passed to cloud user/operator
4. Cloud user “Claims” the device (code)
5. SDK gets “certs”: identity/x509 certificate/MQTT endpoint
6. Securely connects: real-time schema, status, configuration
7. Saves certs on the device



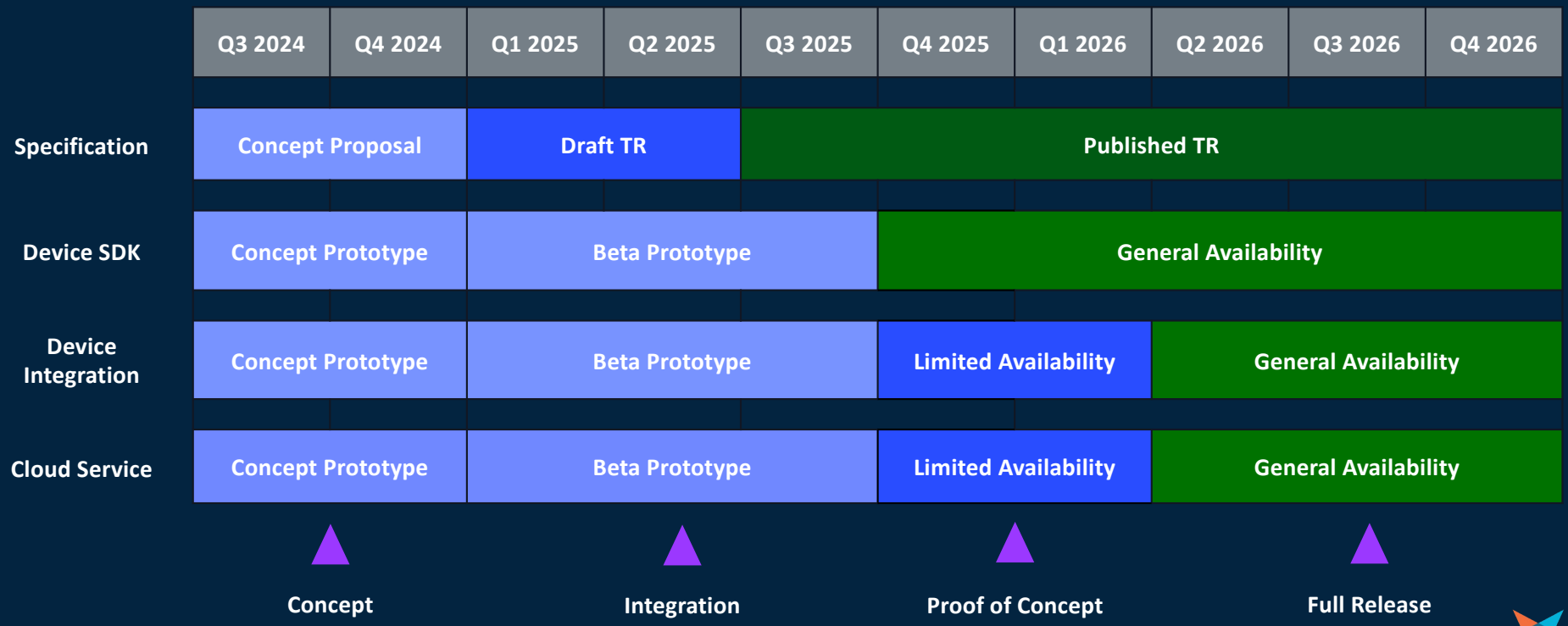
SDK Integration Model

SDK process launched by Host system. IPC between Host and SDK is via localhost REST. The SDK securely communicates with the service via Rest/MQTT

1. HTTPS(Pairing) MQTT (Control)
2. C++ or Python SDK
3. SDK Rest API
4. Device manages the SDK process
5. IPC via Rest
6. SDK uses filesystem to read/write certs



Proposed Timeline



Call to Action

- **VSF Members:** Join the GCCG Activity Group and help us improve Client Device Discovery
- **Device Manufacturers:** Download SDK and reference designs and try them on your device
- **Broadcasters:** Try a Proof of Concept (POC) with the reference service and devices

Thank you

vsf.tv

sdlovely@amazon.com
brundle@amazon.com