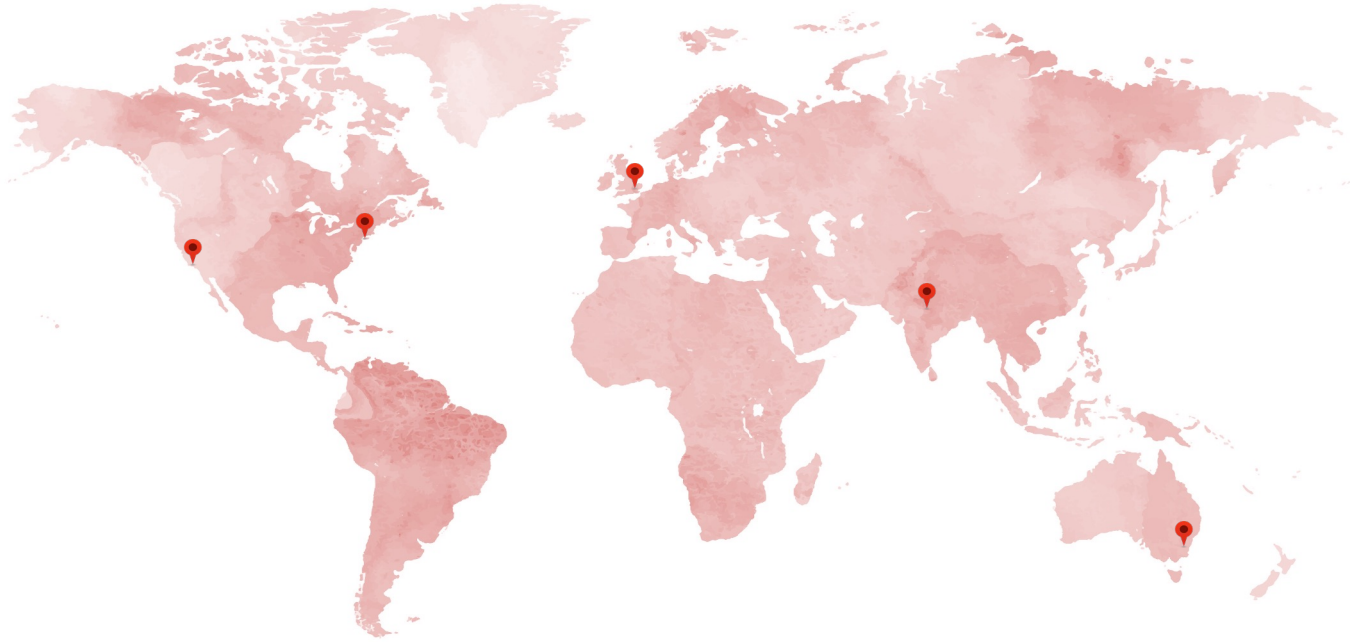
Dante Connect

Technical Deck

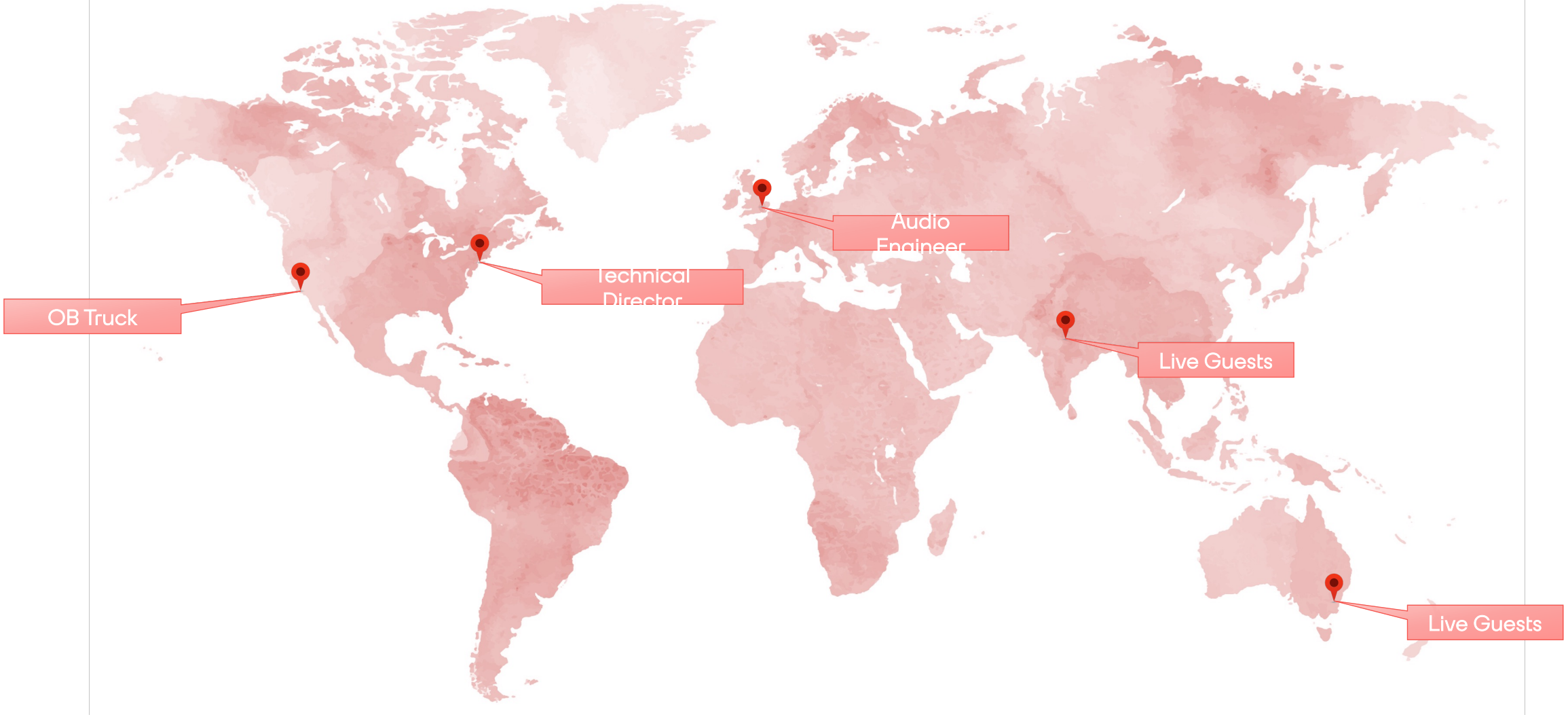
01 Introduction

Cloud Production - Why the cloud?

1. Flexibility and Scalability
   - Lower the Total Cost of Ownership (TCO)
   - Faster Deployment Times
2. Infinite Processing Power
   - No capital overhead
3. Global distribution backbone
   - Better Access to Resources and Teams



Cloud Production – Remote Workflows



What is Dante Connect?

Dante Connect is a collection of Dante products that leverage the Cloud as an Infrastructure.

Enable cloud distribution of Dante audio anywhere without clocking or latency limitations.

Extend Dante networks across on-premise networks and cloud systems

Dante Connect includes

- Dante Domain Manager
- Dante Gateway
- Remote Contribution & Monitoring
- Dante Virtual Soundcard
- Dante Connect SDK

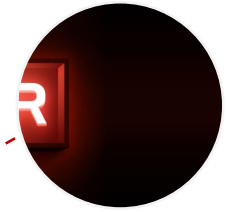
Benefits of Dante Connect

Dante®

- Familiar Dante workflows on-premise and in the cloud
- Bring native Dante audio (uncompressed and synchronized)
  - Into your Cloud Based Media Application
  - Without embedding (muxing) into video sources
  - Globally distributed
- Low-bandwidth remote tools for monitoring & contribution of audio over a public internet connection
- Quickly set up and tear down on cloud platforms as required.

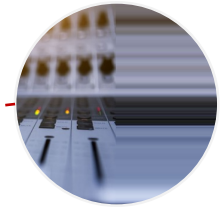
Use Cases in Tier 1 Broadcast

Broadcasters



Live Broadcasting

- Replacing Physical Control Rooms
- Cloud broadcast gallery
- Commoditizing the kit



Remote Production

- Contribution at scale
- Replace traditional OB Trucks

Multi-Language Broadcasting

- Breaking localization and distribution barriers

Production Engagement

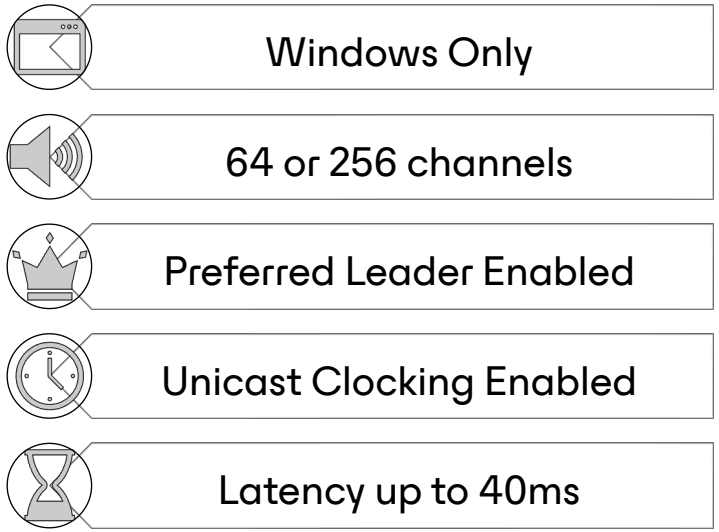
- Interactive experiences

02 Dante Connect Components

Components overview

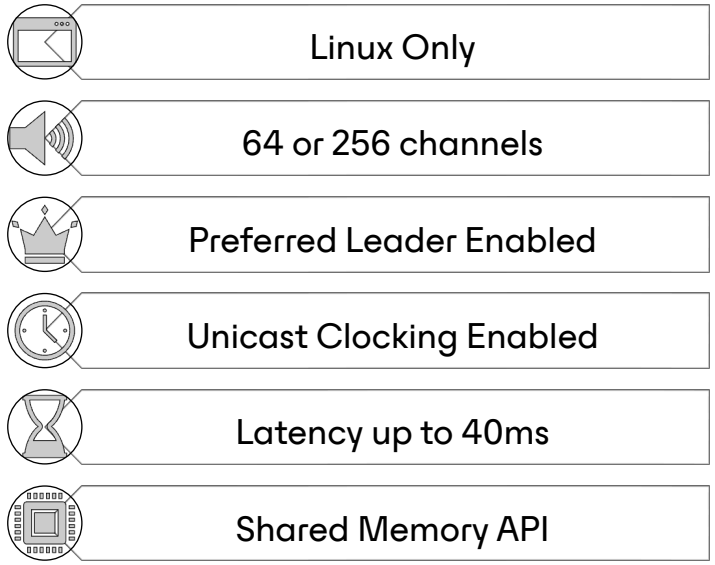
DVS for Dante Connect

- Optimized for Cloud Windows Instances
- Supports up to 256 channels.
- Allows audio to be processed by your preferred media application.



Dante SDK, Connect Edition

- Optimized for Cloud Linux Instances
- Supports up to 256 channels
- Software developers can seamlessly integrate Dante natively into their applications
- Easy activation for customers



Virtual Tempest Engine
Solid State Logic

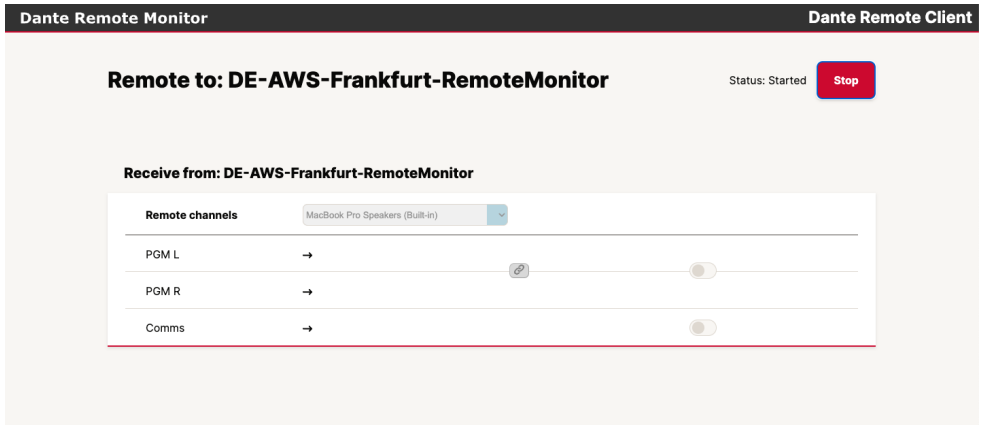
Solid State Logic

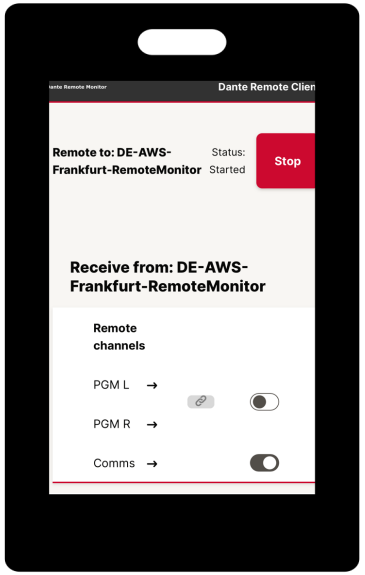
CALREC

SIENNA

Remote Monitor & Contribution

- Listen / Contribute audio from and to the cloud over the public internet via a web browser
- Audio is compressed using OPUS and encapsulated over WebRTC

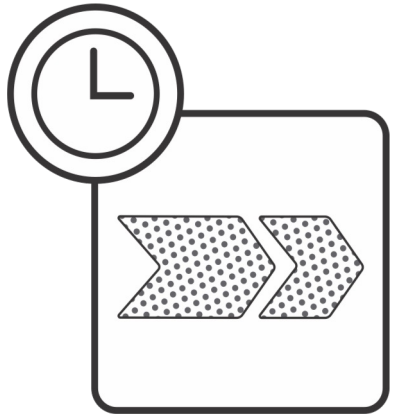




- Dante SDK Based
- Opus/WebRTC based
- Web browser client
- 32 channels
- Preferred Leader Enabled
- Unicast Clocking Enabled
- Latency up to 40ms

Dante Gateway

- A utility Linux based Dante device
- Provides GPS like clocking inside the cloud
  - By leveraging Cloud providers time services
- Audio can be routed through it to compensate for high latency connections



- Dante SDK Based
- 64 or 256 channels
- Preferred Leader Enabled
- Unicast Clocking Enabled
- Asymmetric RX/TX Latencies
- Latency up to 999ms

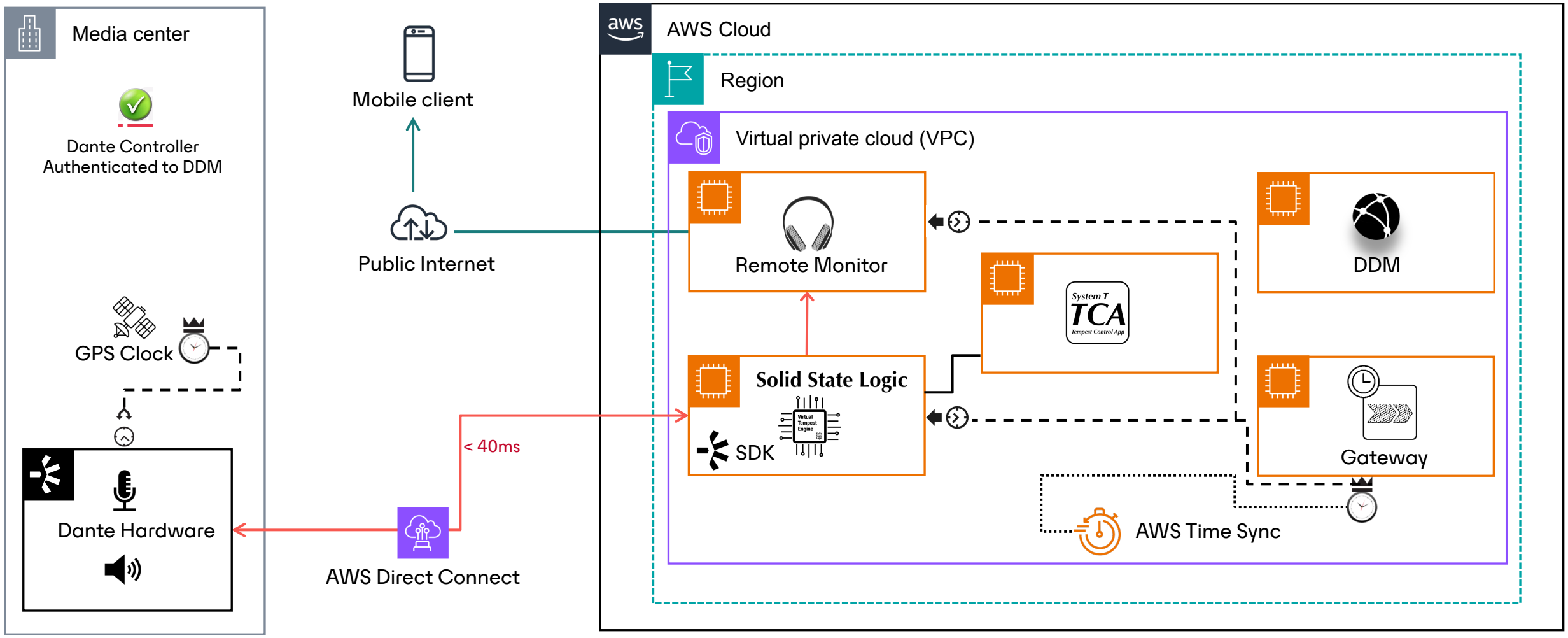
Dante Domain Manager

- DDM provides orchestration, security, and the managed API.
- It discovers all Dante devices, sets permissions, and allows for organization to suit production needs.

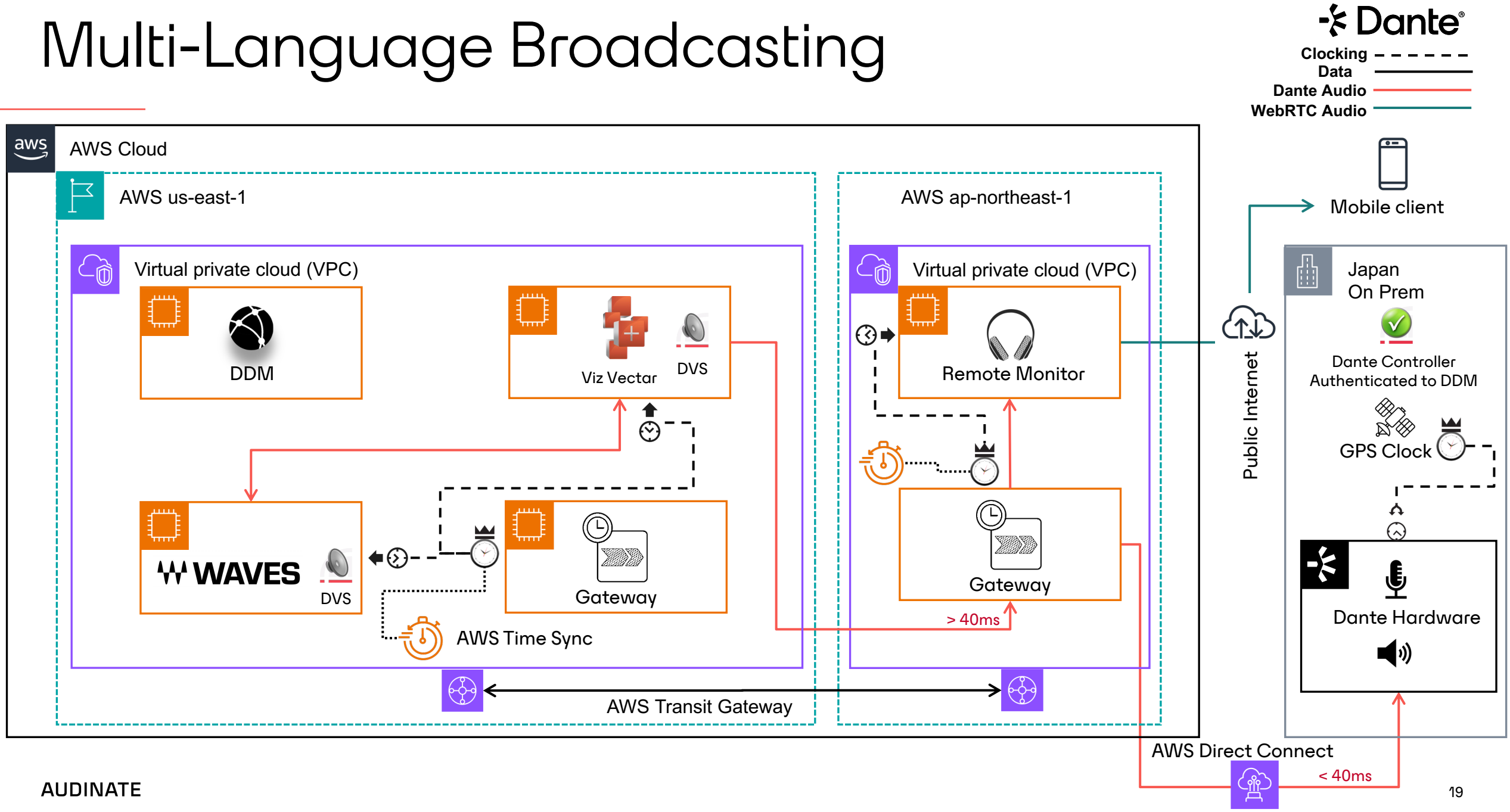
- Up to 1000 nodes
- Device Discovery
- Entitlement Manager
- Global Dante Network
- Cloud Orchestration (API)
- Security & Monitoring

03 Dante Connect Use Cases & Diagrams

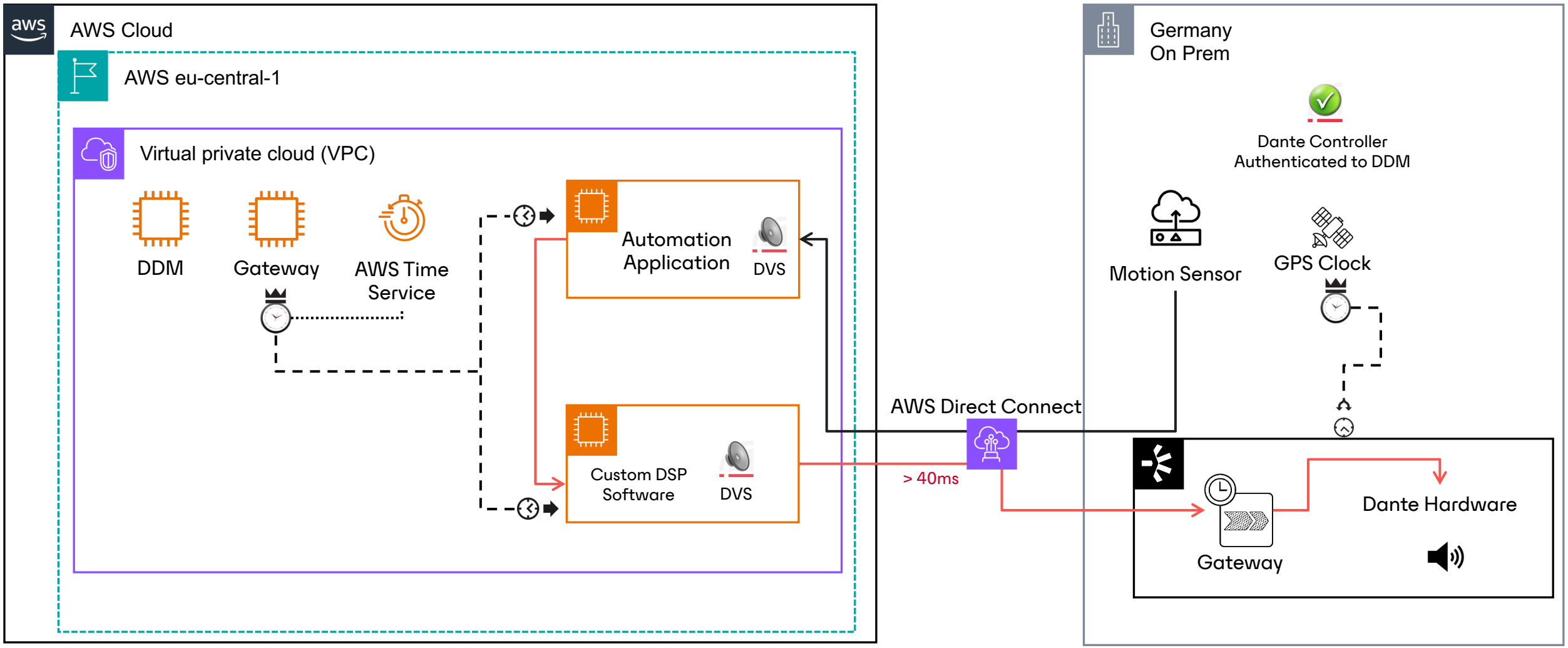
Remote Production



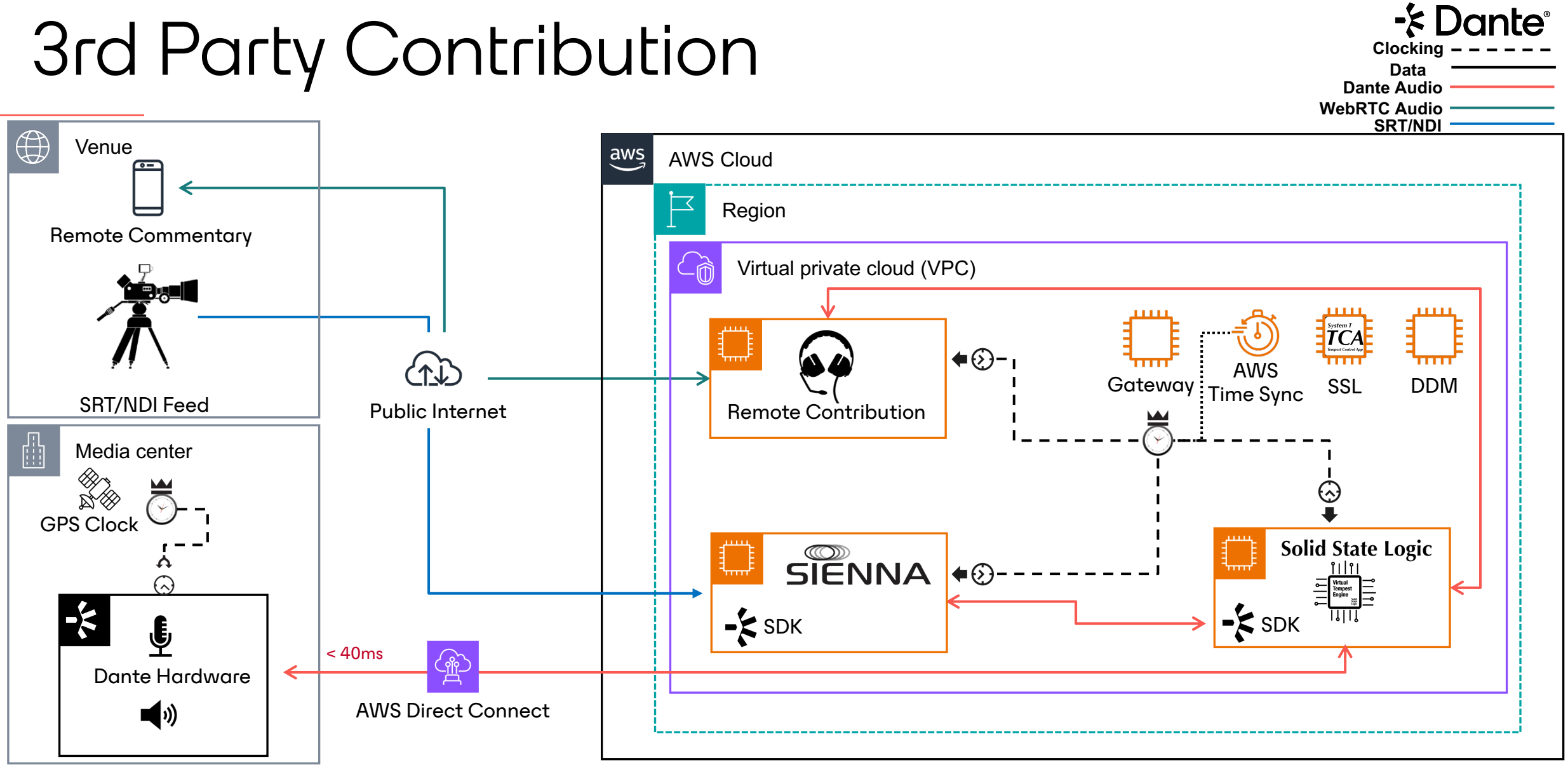
Multi-Language Broadcasting



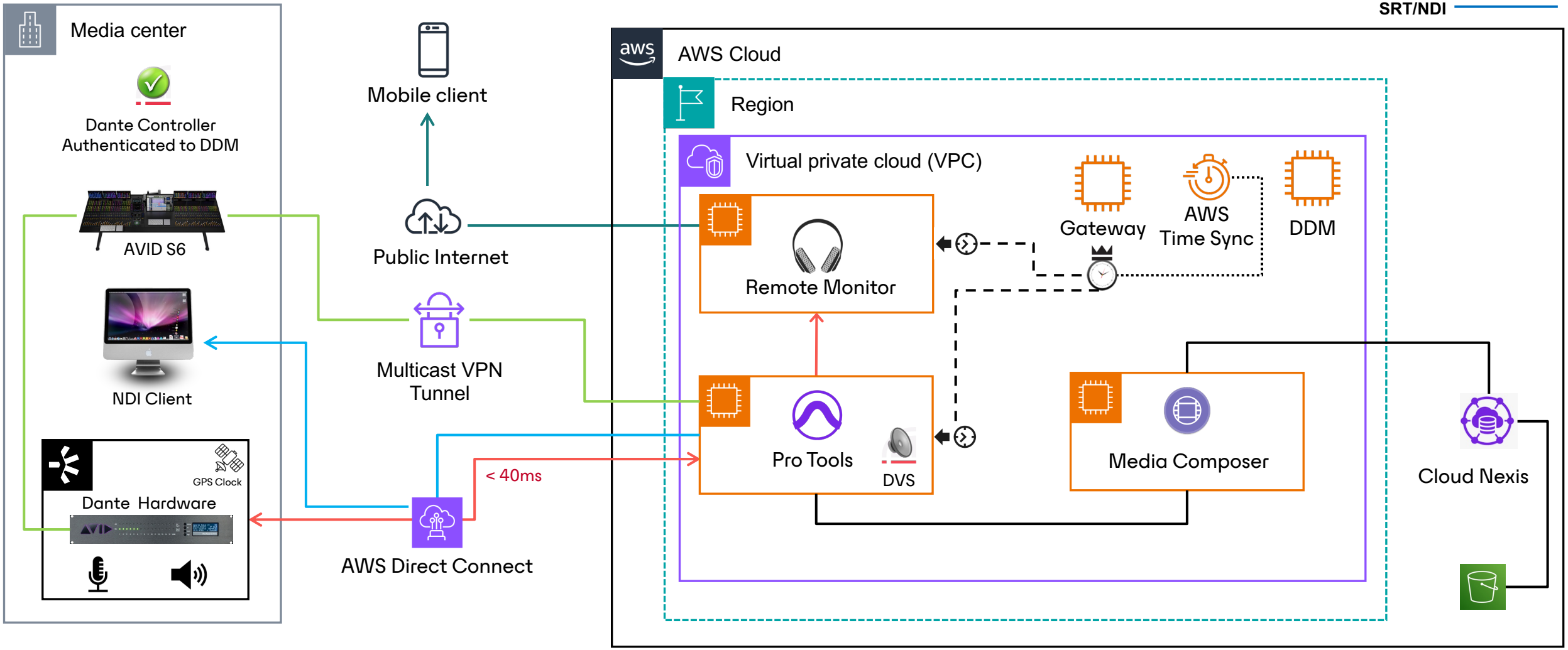
Theme park Playout



3rd Party Contribution



Remote Post-Production



04 Designing with Dante Connect

Pre-requisites

Dante

- Dante Certification Levels 1, 2 & 3
- DDM Administration Cours

Cloud

- AWS Cloud Practitioner
- GCP Cloud Digital Leader

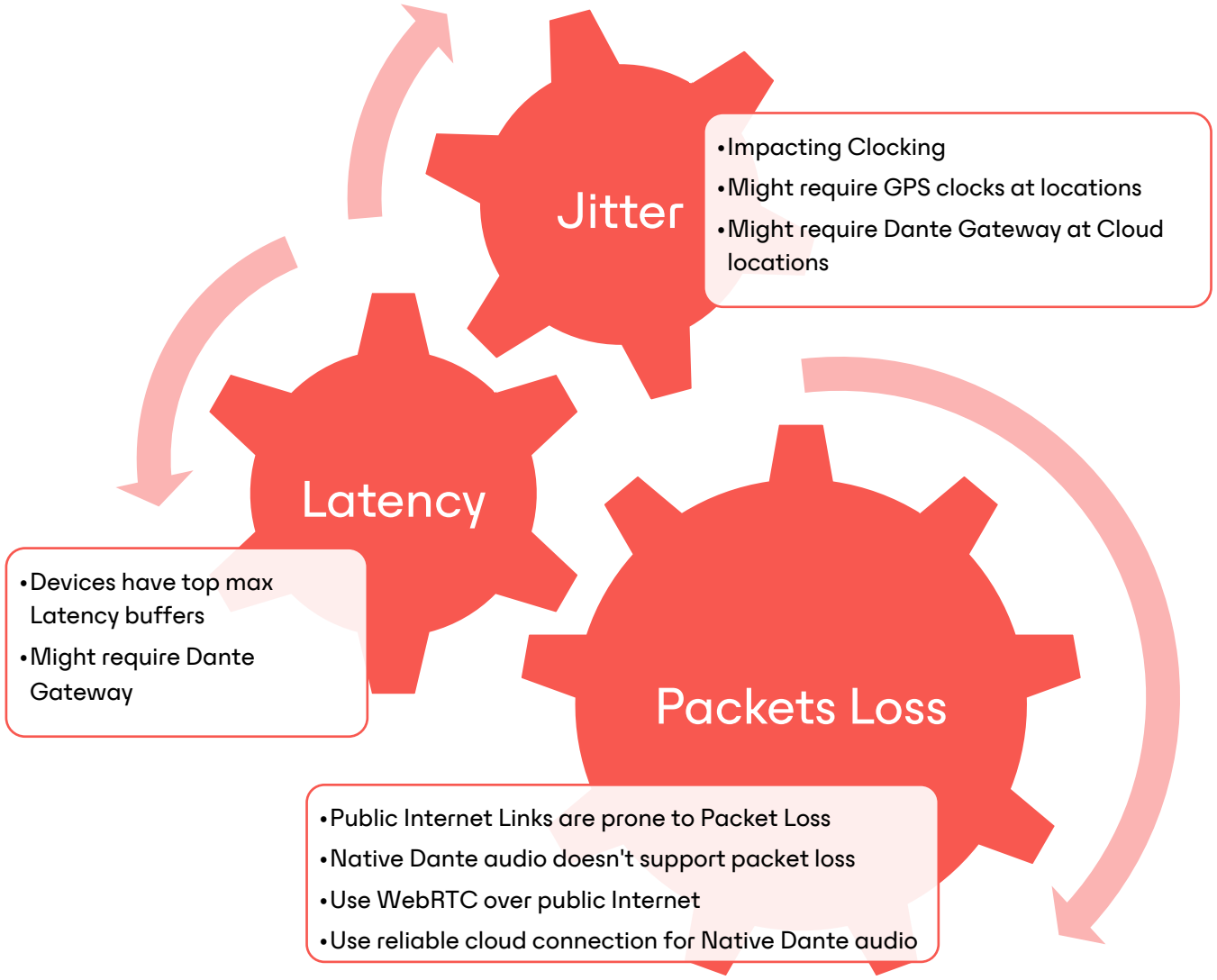
Cloud Support

Dante Connect has cloud integration with multiple cloud providers

- **AWS** – passed AWS Foundational Technical Review (FTR)
- **Google Cloud** as an official Google Cloud Partner for cloud deployments

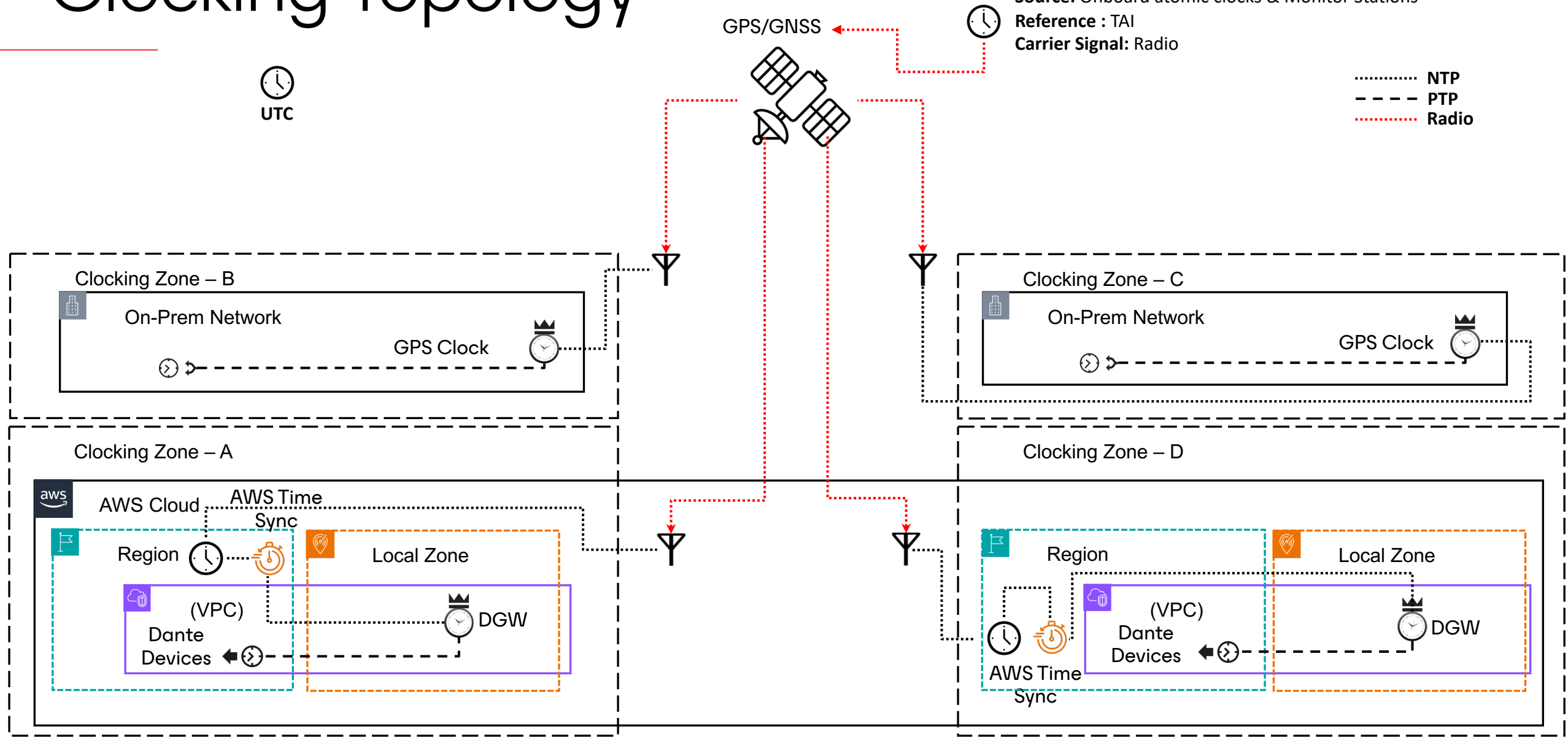
Google Cloud
Partner

Dante Connect network success factors

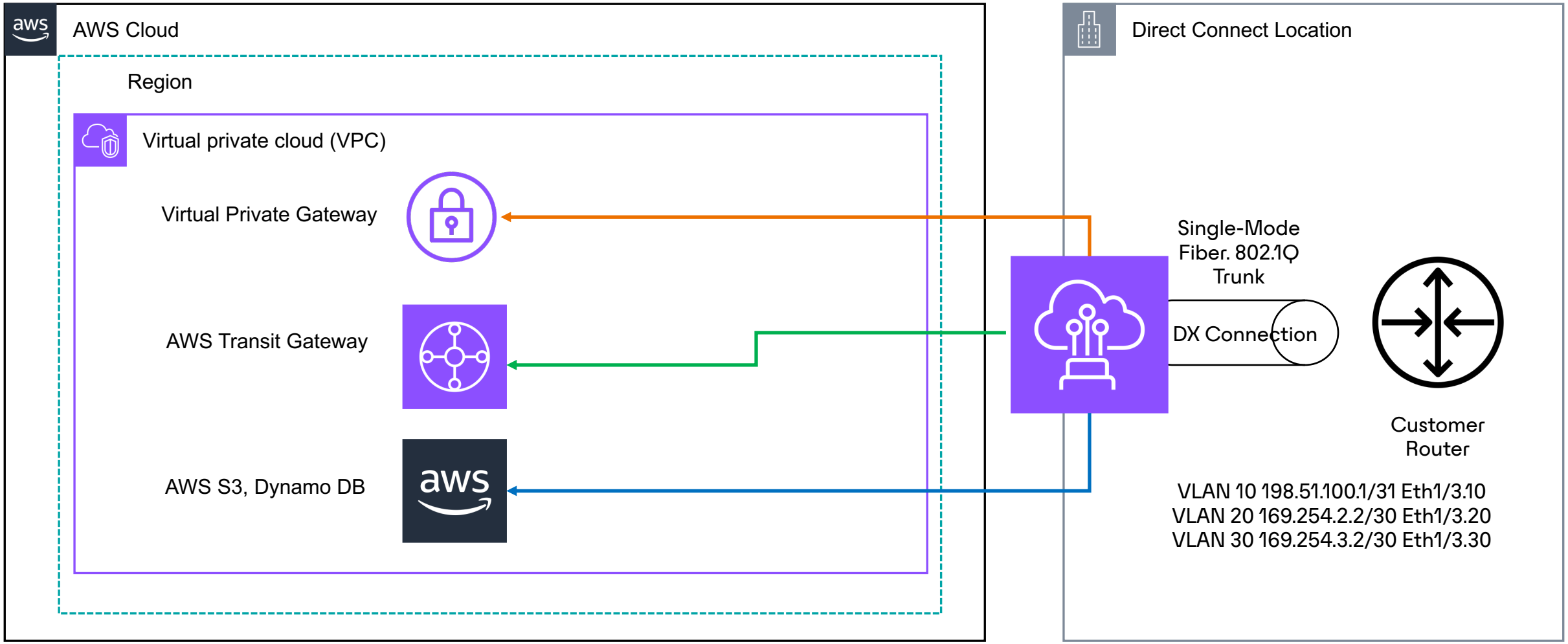


- VPN tunnels are just workarounds not suitable for production.
- Use **Direct Connect** or similar to avoid Jitter, Latency and Packet Loss.

Clocking Topology



AWS Direct Connect



Cloud contribution types

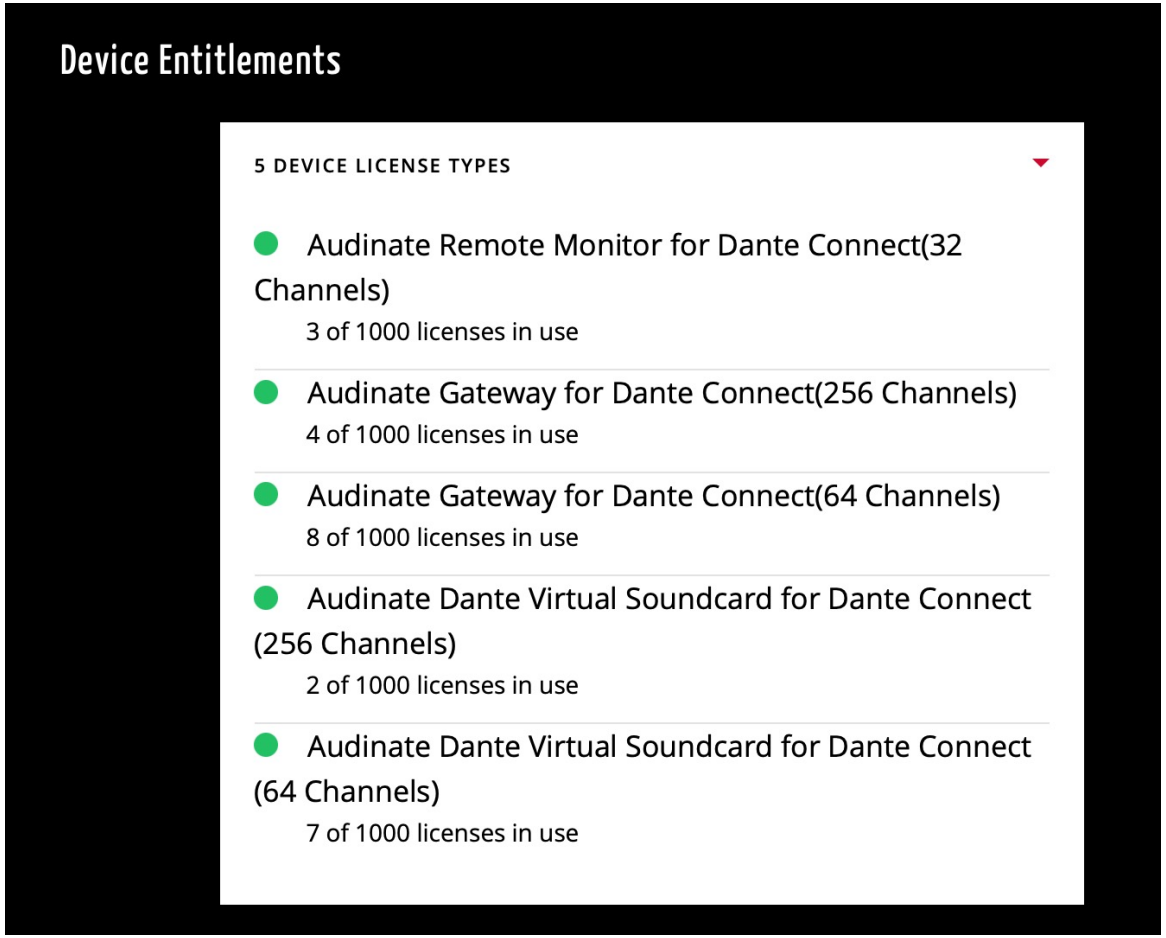
Contribution type	Native Dante	WebRTC-based	Others
Technology	• Dante Connect • Dante enabled hardware	• Dante Connect • Any web browser with internet connection	• Virtual Meeting Room Application • SRT • Bespoke App
High-bandwidth, direct connection required	Yes	No	Sometimes
Mb/second audio contribution	6 Mbps per 4 channels	500 kbps per channel	Varied
IFB	Dante Partner Enabled	Dante Partner Enabled	Varied
Compression	Uncompressed	High-Quality	Varied
Requirements	High-Quality Internet Connection	Standard Internet	Standard Internet / Phone System

Connect Components Entitlement

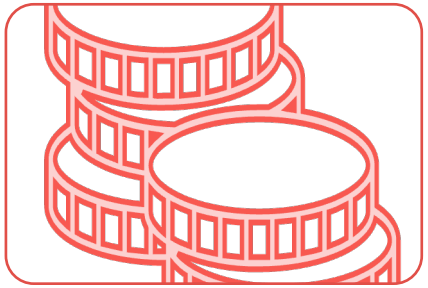
- Components concurrency is reinforced by Dante Domain Manager
- Dante Connect components have 0x0 channels when unenrolled
- Channels are enabled upon enrollment

Usage Based on Time Unit: Tokens enable usage for:

- Single day (24 hours)
- A month (30 days)

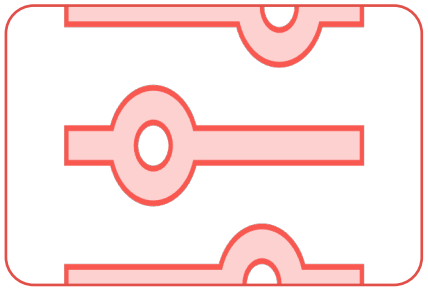


Connect Licensing - Event-Based Tokens



Two Token Types: Small Tokens for corporate events and Large Tokens for live sports production.

Stackable for Extended Access: Tokens can be redeemed to extend access, offering unparalleled flexibility.



MOQ of Tokens: Ensures viability and encourages bulk purchases. Allows Reseller involvement.

Event Based Model

Large Token Bundle	
Qty.	Modules
∞	DVS-256 or -64
∞	GW-256 or -64
∞	Remote Monitor 32
∞	Remote Contributor 2 channel
1	DDM - Dante Connect Edition

Small Token Bundle	
Qty.	Modules
2	DVS-64x64
2	GW-64x64
1	Remote Monitor 32
2	Remote Contributor 2 channel
1	DDM - Dante Connect Edition

- Best choice for Sports

- Perfect for smaller productions, virtual corporate events, testing & evaluation.
- **Only available as a daily token**

Infrastructure as Code

- Terraform modules* plus Dante Managed API automation allows you to get set up in minutes.
- Deploy Instances running Dante Virtual Soundcard, Dante Gateway, Remote Monitoring & Contribution
- Create and enroll devices into Domains
- Configure clocking and subscriptions.
- Teardown just as quickly so only the resources you need are used.

*Only available for AWS now

05 Deploying Dante Connect

Dante Connect Resources

All Dante Connect Resources:

1. Installers
2. Deployment and Configuration Guide
3. User Guide

Dante Connect™

Can be downloaded from the following URL (login required):

https://my.audinate.com/support/downloads/dante-connect

Dante Connect Components requirements

Component	OS	Minimum Capacity	GPU	Installation
Dante Domain Manager	Rocky 9 x86 64bit	t3.medium	No	AMI* / Script
Gateway	Ubuntu Server 22.04 x86 64 bit	m5.large		Debian package / Terraform
Dante SDK				OEM specific
Remote Monitoring & Contribution				Script
Dante Virtual Soundcard	Windows Server 2022 Base x86 64 Bit		Depends on the Media Application	Manual / Terraform

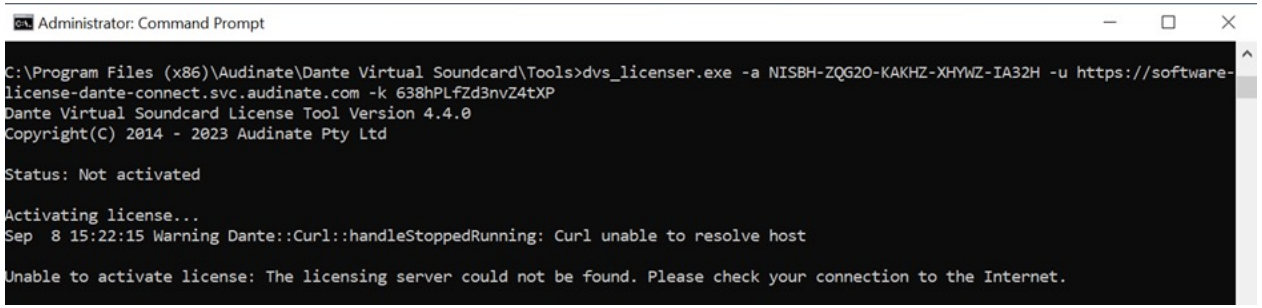
**Private AMI to be shared by Audinate*

Manual deployment

Components can be manually installed by using:

- Windows MSI Installer (DVS)
- Debian Packages (Gateway)
- Customer Installer script (Remote Monitoring & Contribution)

Components must be licensed using the command lines provided in the documentation



Terraform deployment

AWS Terraform modules for the following modules:

1. Dante Virtual Soundcard
2. Dante Gateway
3. Remote Monitoring & Contribution

Are available on the following repository:

https://github.com/Audinate/terraform-aws-dante-connect

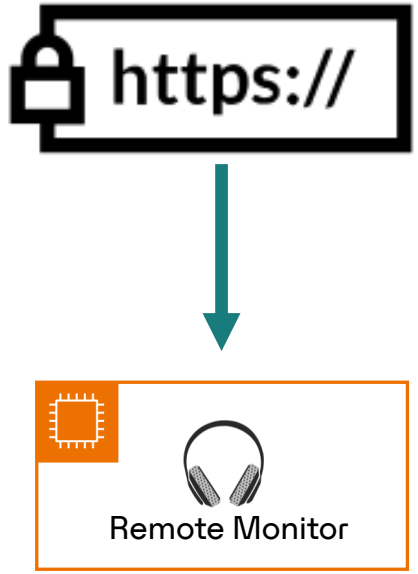
Remote Monitoring & Contribution deployment options

WebRTC audio requires TLS encryption for playback through a Web Browser.

The Remote Monitoring & Contribution tool does **NOT** enable TLS by default.

TLS encryption can be enabled by one of these options*:

1. Deploying an AWS Application Load Balancer
2. Use your own private Reverse Proxy
3. Upload your own Certificate on the Instance



*More details can be found on the Deployment guide

Connect Components OnPrem

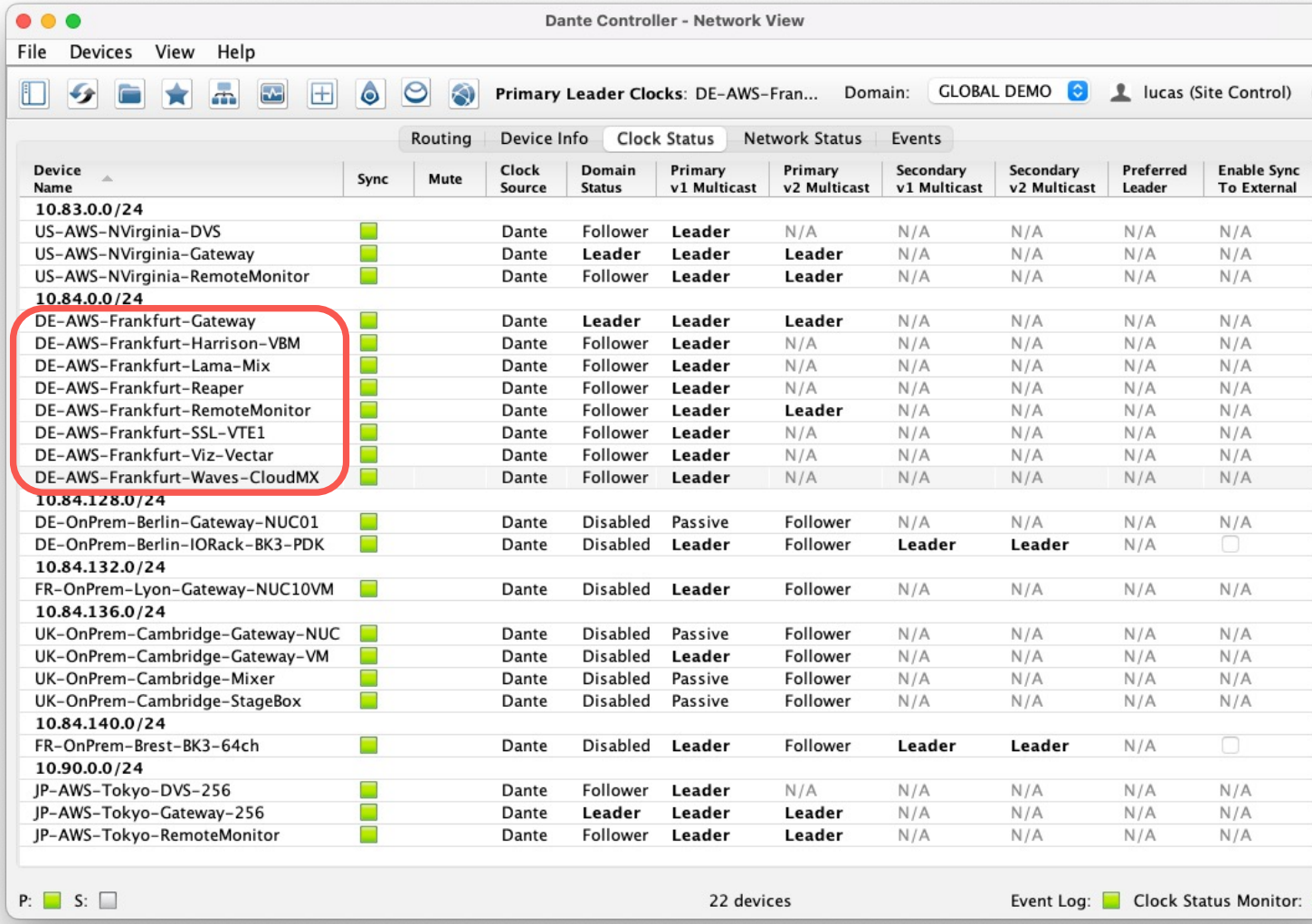
There be will scenarios where you might need to run Dante Connect components On Prem, like Dante Gateway.

In those cases, we recommend the following:

1. Installation on Enterprise Hypervisor or Baremetal Servers
2. NIC interfaces capable of Hardware Timestamping
3. Using GPS Clocks sources
    - Software devices are not the ideal Clock Leaders
    - Gateway using Public NTP Servers might be prone to Clock Sync issues

Workflow recommendations

1. Use consistent Dante devices naming conventions
2. Cloud Instances Tagging

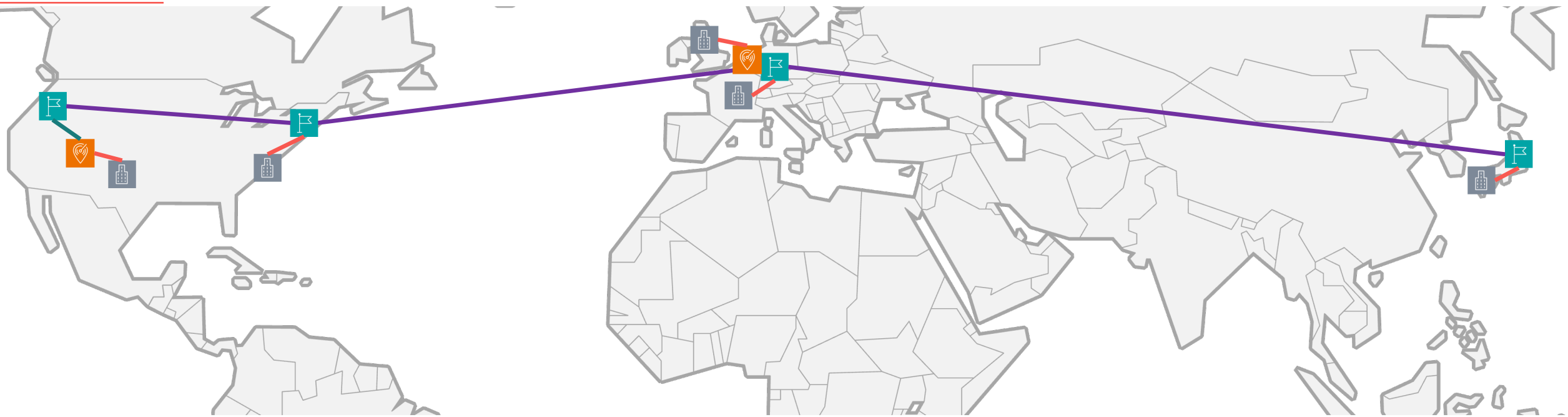


Troubleshooting

- Security Groups
- Firewall ports
- Components Licensing
- Unicast clocking / Clock Zoning
- Latency readings
- Subscription status
- DDM DNS Discovery
- Backup and recovery


Questions?

Global Demo Network Backbone



Locations:
- AWS Regions
- AWS Local Zones
- OnPrem Networks

Network Links:
- AWS Transit Gateways
- AWS VPC
- AWS Direct Connect