



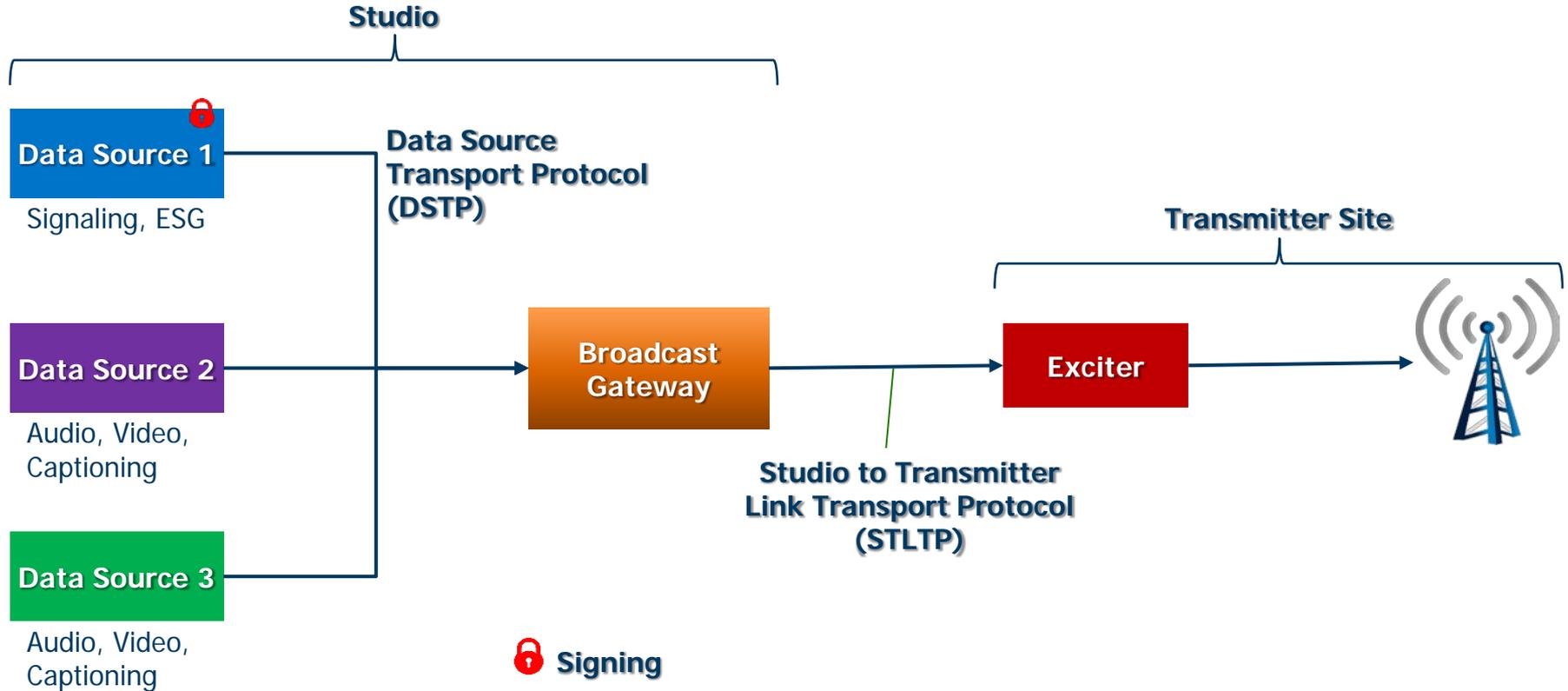
How to Deliver NEXTGEN TV with Minimal Costs, Equipment, and Power Usage

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Title: Sr VP Sales & Marketing

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ATSC 3.0 Transport Concepts

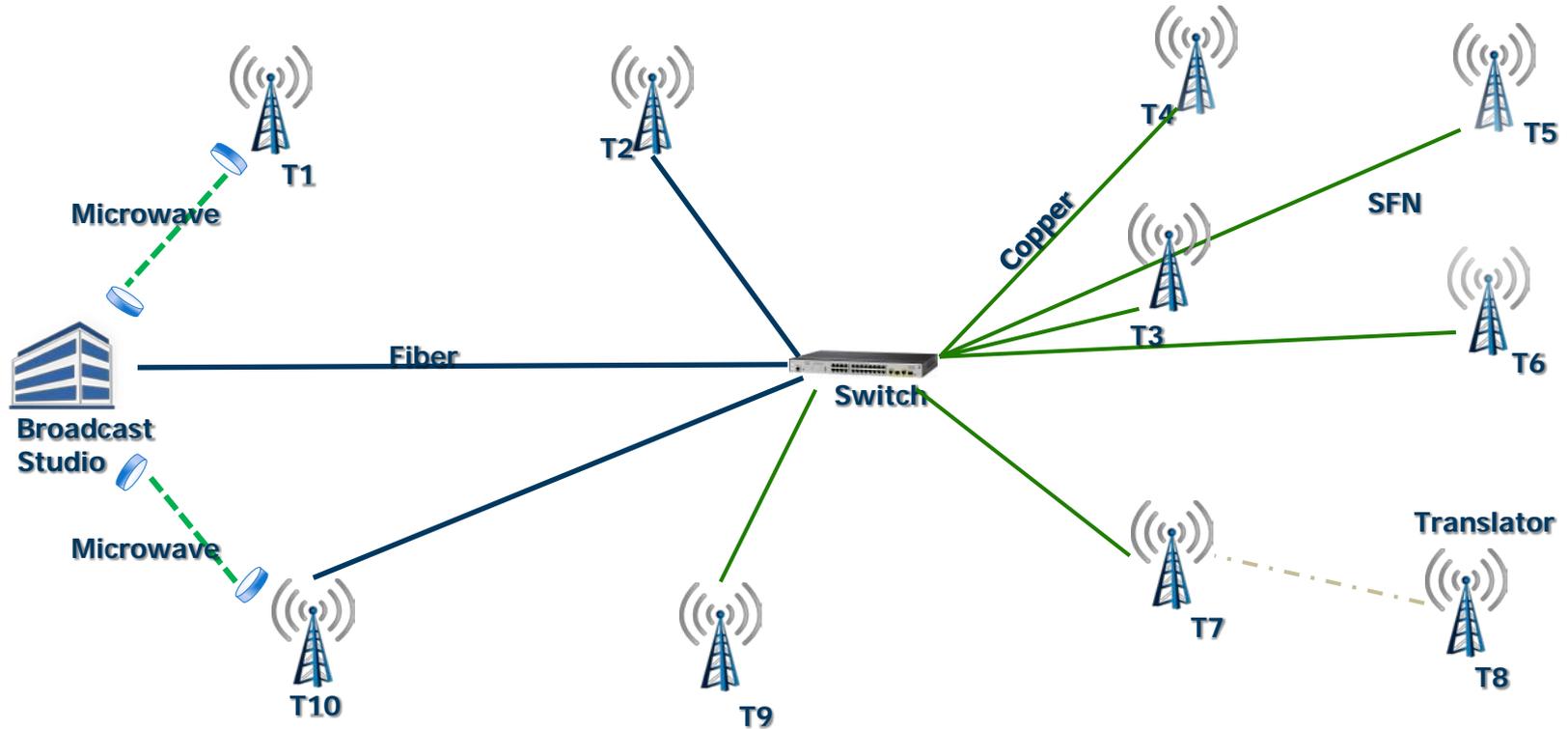


ATSC 3.0 = IP Transport

All ATSC 3.0 Transport is IP

- *Any* UDP/IP stream can be sent over an ATSC 3.0 broadcast
 - ➔ DSTP and STLTP are RTP/UDP/IP fixed-sized-packet streams with optional FEC
- Broadcast Gateways are essentially unidirectional routers

National ATSC 3.0 Broadcast Network



Translator Requirements

- Receive an ATSC 3.0 Broadcast on one frequency and translate it to another
- Change signaling to reflect the new frequency: call letters, major number, etc.

Nice to have:

- Localize content for new region covered by frequency
- Localize EAS
- Others?

Constraints

Single STLTP → Same Stream to all Transmitters

- ATSC 3.0 requires all signaling and interactive content to be signed
 - ↖ Signing *should* be done in a secure facility
- There are signaling groups that can be signed independently – filtering is done at receivers
- Content / Signaling cannot be regionalized without a separate STLTP

Generating a separate complete STLTP for each transmitter is problematic

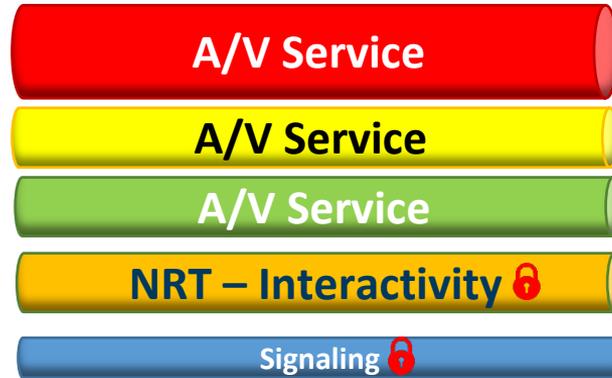
- Most data are redundant
- Cost is likely higher because of multiplicity of studio equipment
- Bandwidth restrictions in network

ATSC 3.0 Broadcast IP 'Pipes'



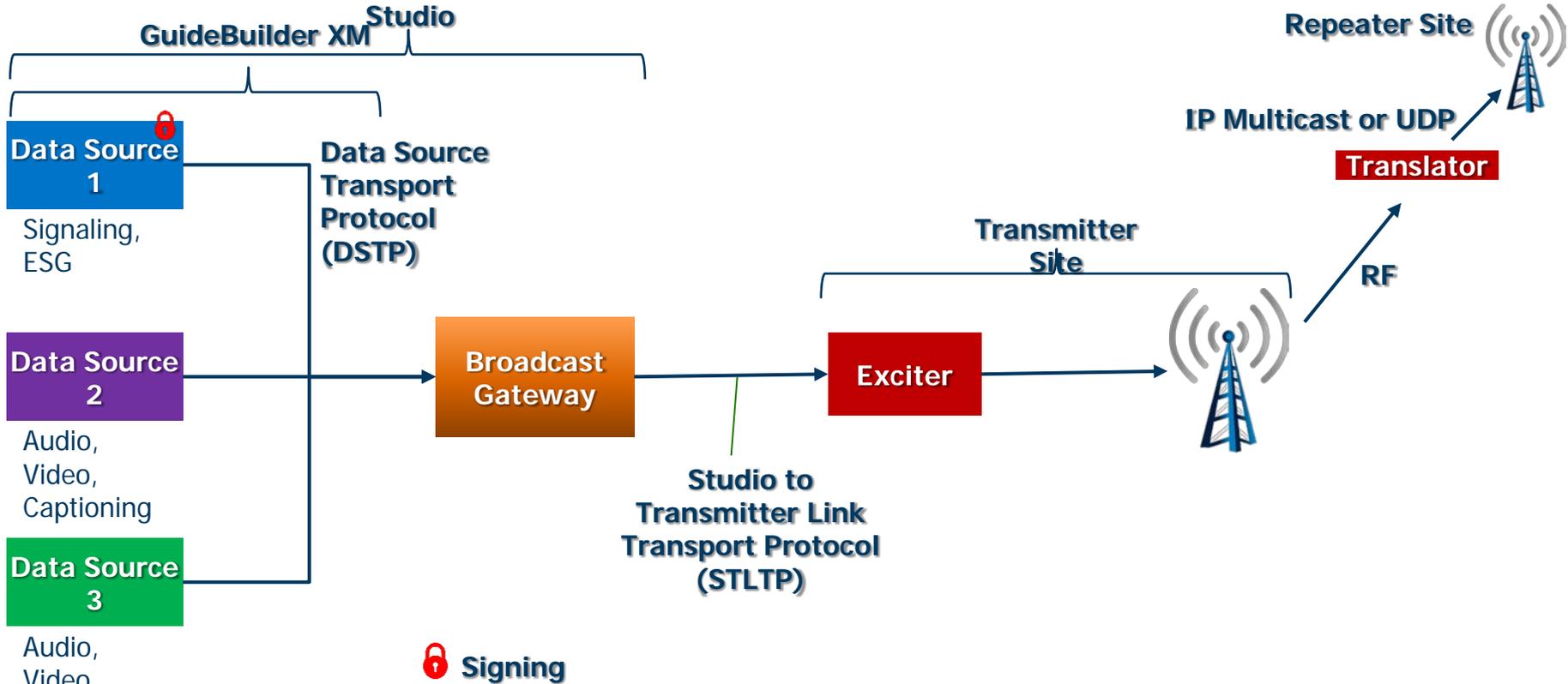
Source
Transmitter

ATSC 3.0 Broadcast Services



 Signed

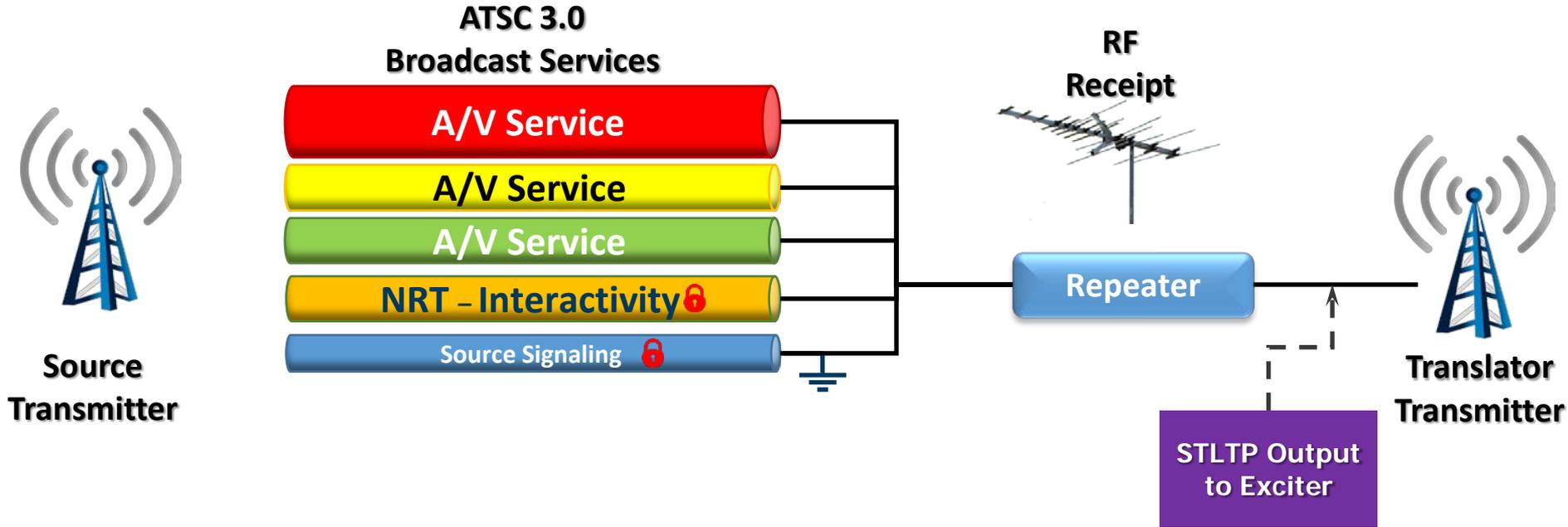
ATSC 3.0 Broadcast Chain with Translated Output



Options addressing the requirements

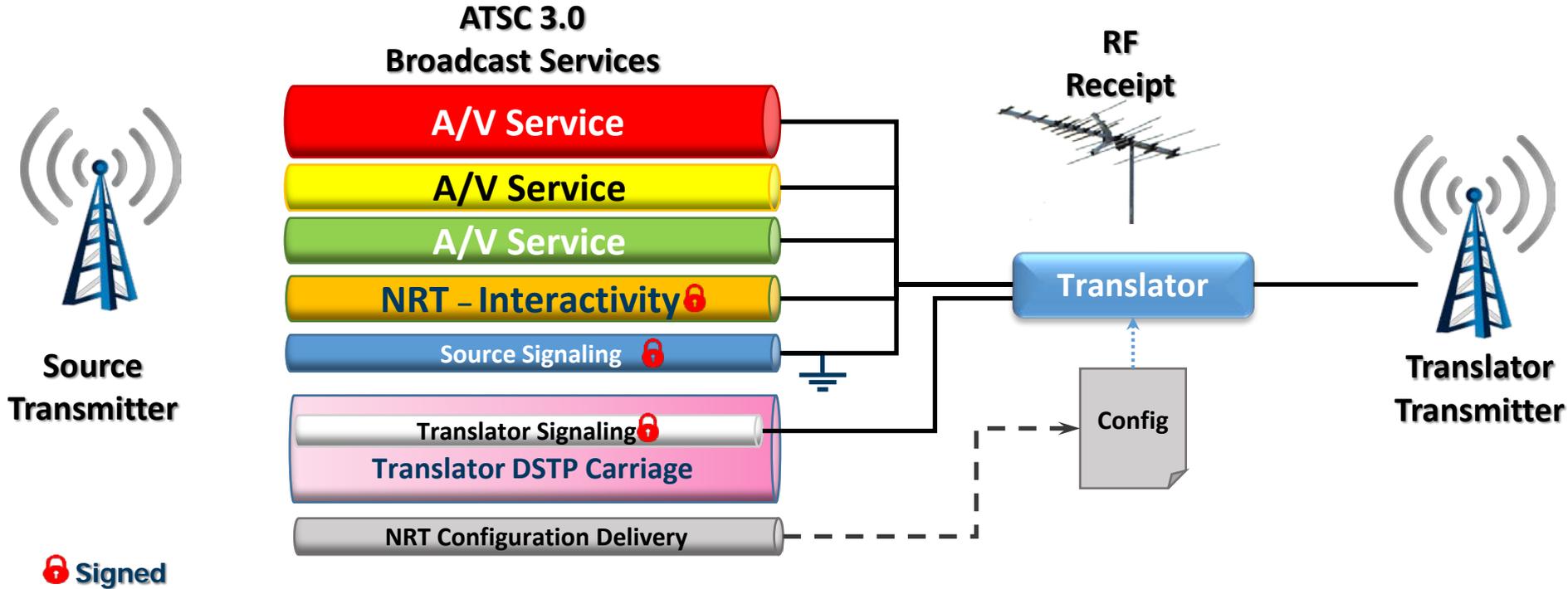
- Repeater: No change, just conversion from RF to STLTP
- Translator: Major Channel Number Change and Signing
- Translator+: Localization

ATSC 3.0 Secure Repeater

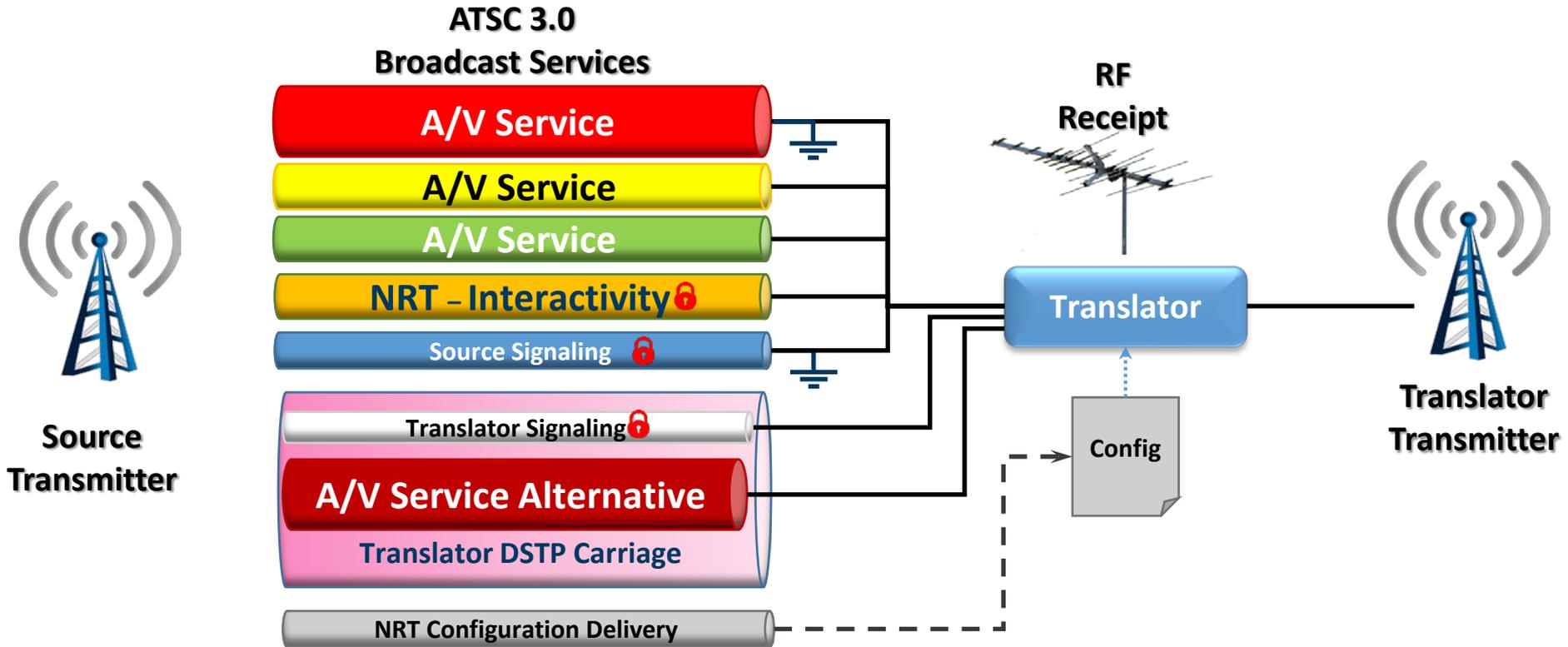


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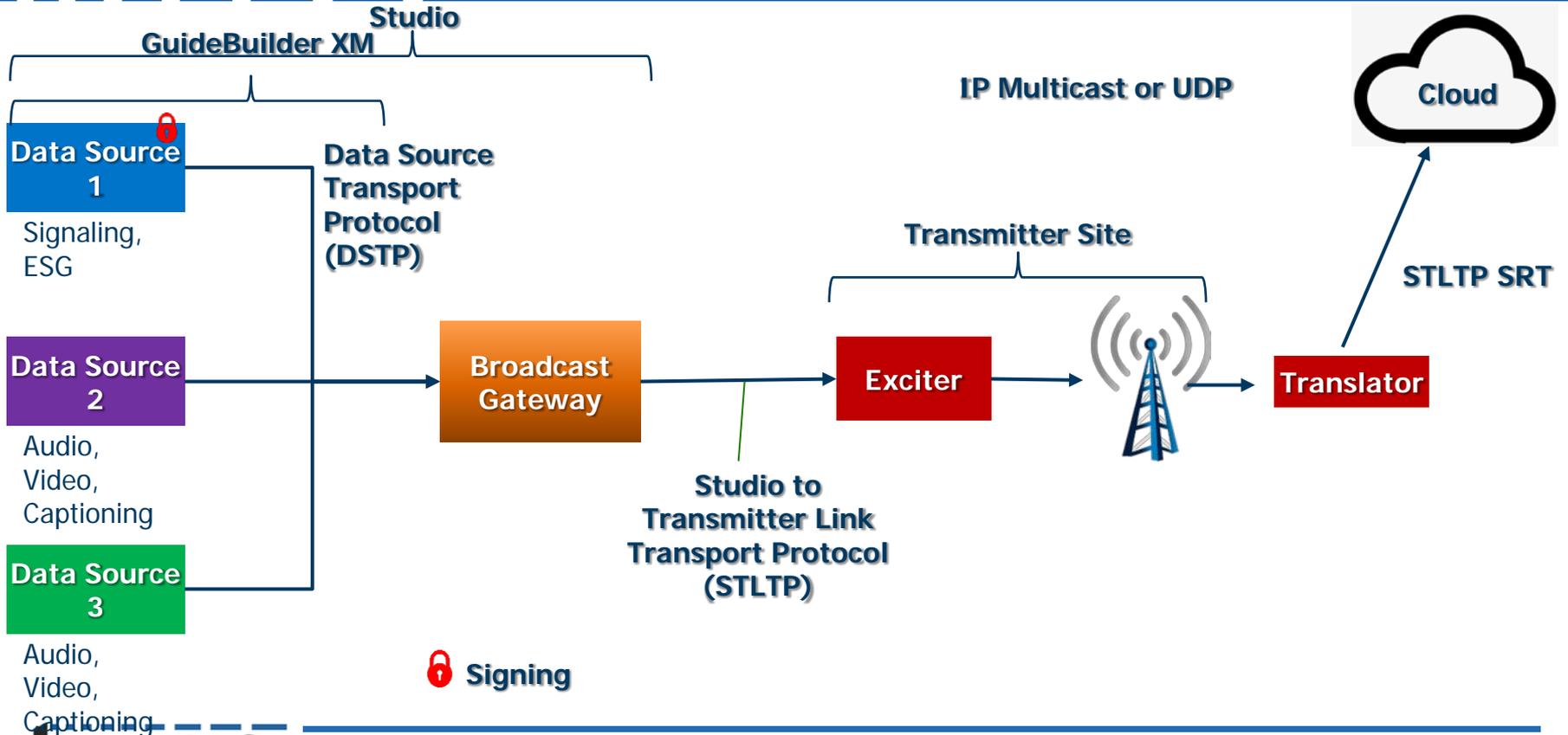
ATSC 3.0 Secure Translator



ATSC 3.0 Secure Translator+



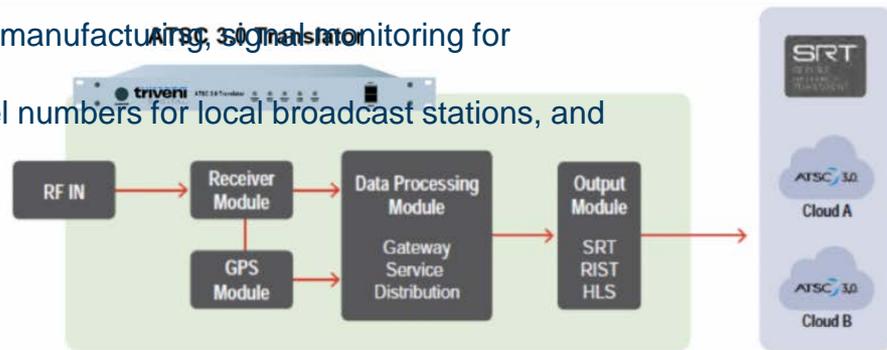
ATSC 3.0 Translator with SRT output



ATSC 3.0 Repeater & Translator

Introduction

Ideal for public statewide networks and private Cloud-based environments, this compact programmable receiver converts ATSC 3.0 RF signals as well as STLTP to the Secure Reliable Transport (SRT) protocol. It's also useful for business channels using SRT distribution, signal capturing for manufacturing, signal monitoring for automobiles and remote areas, ATSC 3.0 retransmission, changing channel numbers for local broadcast stations, and more.



The ATSC 3.0 Translator efficiently transmits, and makes it easy to troubleshoot, ATSC 3.0 services via the SRT protocol.

Options

1. Repeater (no changes)
2. Translator (Call Letter changes, Signing, etc).
3. Translator advanced (+local content insertion)

Triveni Digital advantages

- **Experience**
 - 25+ year history of innovation, solid deployments and custom projects
 - Largest broadcast market share captured by all three product families
 - Broadest deployment architecture options
- **Installed base**
 - ATSC 3.0 extensions from robust ATSC 1.0 software foundation
 - Extension of base yields architecture, workflow & cost advantages
- **Support**
 - Experienced, highly-rated service/support team
 - Same time zones, same language, long relationships
- **Technology**
 - Deep broadcast, satellite, MVPD market experience/technology w/ hybrid IP distribution overlay
 - Lead ATSC 3.0 standard development process overall, and key sub parts
 - Key provider to all early ATSC 3.0 stations; heavy investment in ATSC 3.0 technology
- **Partnerships**
 - Working with virtually all major broadcast equipment suppliers for robust ATSC 3.0 ecosystem
 - Agile company, broadcast segment focused

